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MAY 1959

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FOOD ENGINEERING

FOR MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

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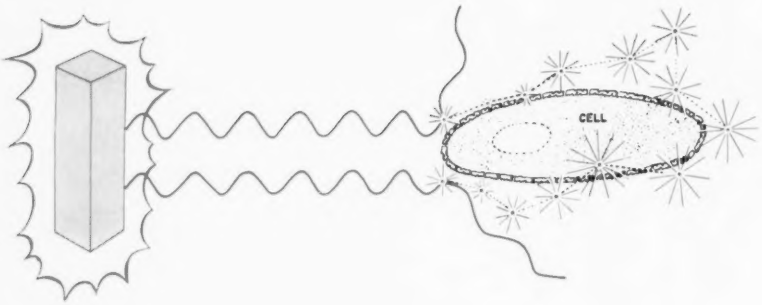

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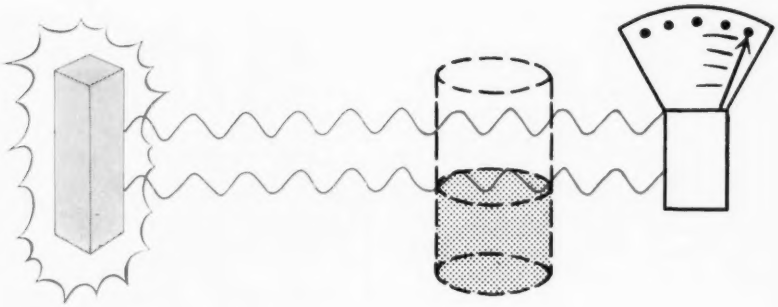

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FOR MANAGEMENT

MAY, 1959

30th YEAR

VOL. 31 NO. 5

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FOOD ENGINEERING (Formerly Food Industries)
May, 1959, Vol. 31, No. 5

Published monthly by the McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948), founder **Executive, Editorial, Circulation, and Advertising Offices, McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** Publication Office, 99-129 N. Broadway, Albany 1, N. Y. See panel below for directions regarding subscriptions or change of address. Second class mail privileges authorized at Post Office, Albany, N. Y. Printed in U.S.A. Title registered in U.S. Patent Office. ©Copyright 1959 by McGraw-Hill Publishing Co., Inc., all rights reserved.

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SUBSCRIBERS: Send subscription correspondence and change of address to Fulfillment Manager, Food Engineering, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify Fulfillment Manager promptly of any change of address, giving old as well as new address, and **including postal zone,** if any (Official Post Office Request). If possible, enclose an address label from a recent issue of the magazine. Since copies are addressed one to two issues in advance please allow one month for change to become effective.

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TRENDS & FORECASTS

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Food and beverage manufacturers plan to spend $783 million for modernization and expansion this year, up 6% over '58, a McGraw-Hill survey reveals. Increase is 8%, to $613 million, for food firms in contrast to 3% decline, to $170 million, for beverage companies. Firms in North Central area account for 51% of total.

Capital expenditures already planned for 1960, '61, and '62 amount to $719, $702, and $692 million, respectively.

Replacement and modernization will account for 77% of capital outlay this year, 23% going for expansion. For 1960-62, percentages are 72, 28.

Buildings will take 28.2% of capital expenditures, vehicles 8.6%, other machinery and equipment 63.2% this year.

Research and development expenditures are put at $100.1 million this year, up 5.7%. For '62, forecast is $119.1 million. Outlay for research facilities in '59 will be $20 million.

Depreciation allowances this year will amount to $837 million and will increase to $951 million by '62. If allowances permitted were substantially increased, 36% would spend more on plants and equipment, 33% would rely less on outside funds, 11% would reduce debt.

Physical sales volume for the industry will be up 6% this year, McGraw-Hill survey indicates. Employment will gain 2% in '59 and 4% in next 3 yr.

Production capacity index will increase 4% in '59 to 138 (Dec., '50 = 100) and will hit 152 by '62. Last year, food plants operated at 82% of capacity, up 2% over '57. Preferred rate is 90%.

Important advances in productivity have been chalked up in past 10 yr., Bureau of Labor Statistics reports. Gains are 59.9% for canning, preserving, and freezing; 57.5 for confectionery plants; 42.1 in milling; 37.9 for beet sugar factories (rated up to '54).

Net income after taxes increased 6% last year for 13 meat packers and 5% for 14 dairy firms, but dropped 3% for 20 bakeries and 29% for 21 sugar refiners. For 83 other food products companies, net income gained 6%, according to First National City Bank tabulation.

Output of hot-pack single-strength citrus juices dropped in '57-'58 by these amounts: Orange juice, 7.8% to 18.6 million cases; grapefruit juice, 31% to 9.3 million; blended (orange and grapefruit) 7.8% to 4.1 million.

Frozen fish and shellfish production last year totaled 322.2 million lb. in 299 domestic plants, Bureau of Commercial Fisheries reports. Of this, shellfish accounted for 90.5 million lb.

See Developments to Watch p. 13

Cans for soft drinks increased 8.6% to 405 million last year, and beer cans are expected to gain 5% to 8.8 billion, in '59, American Can reports.

New all-time production records for these dairy products were established in '58: Brick, munster, cream, cottage, and Italian cheese; nonfat dry milk; ice milk, and Mellorine. Ice cream was highest except for '46.

Last year's pack of canned peaches was up 0.9% to 28.4 million cases. Canned fruit cocktail in California increased slightly to 15.1 million cases.

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May

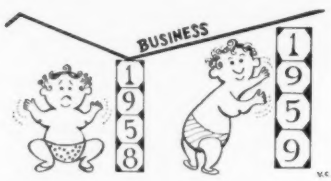
10-13—Flavoring Extract Mfrs. Assn., annual meeting; Roosevelt Hotel, New York.
10-14—American Society of Brewing Chemists, Silver Anniversary Convention; Queen Elizabeth Hotel, Montreal.
11-14—Assn. of Operative Millers, annual meeting; Sherman Hotel, Chicago.
13-15—Millers National Federation, annual convention; Edgewater Beach Hotel, Chicago.
17-21—Institute of Food Technologists, annual convention & exhibit; Bellevue-Stratford Hotel, Philadelphia.

June

4-14—Food & Beverage Show, International Fair; Cow Palace, San Francisco.
8-10—Grocery Mfrs. of America, mid-year meeting; Greenbrier Hotel, White Sulphur Springs, W. Va.
8-11—National Confectioners Assn., annual meeting; Conrad Hilton Hotel, Chicago.
9-12—Materials Handling Institute; Public Auditorium, Cleveland.
9-13—Inter-America Food Institute, 2nd International Congress; Carillon Hotel, Miami Beach, Fla.
14-17—Processed Apples Institute, annual meeting; Whiteface Inn, Lake Placid, N. Y.

HORS D'OEUVRES

▶ At current rate of explosion, world population will be so dense in 600 years that each person will have but 1 square meter of space. Someone tell Secretary Benson that his surplus food problem is by way of being solved.



▶ With births in February up 3½% over a year ago, a new baby boom apparently was initiated about the time business started to recover. Seems that economists could use a gleam-in-the-eye-of-parents index.

▶ In one high school studied, seven of every ten students eat skimpy breakfasts and lunches. Apparently teenagers live on hot dogs and puppy love.

▶ The inner-self that warns against drinking coffee on TV commercials is giving the coffee industry tea nerves. It wants the tea boys to ask their inner-selves if it's all quite cricket.

▶ When the first coffee house opened in Constantinople in 1554, beautiful slave girls served the food. Diners couldn't tip the waitresses, but they could buy them.

▶ Comes now a hot dog cooker that plugs into your car's lighter socket. But even a dog should be entitled to the culinary courtesy of a pause for refreshment.

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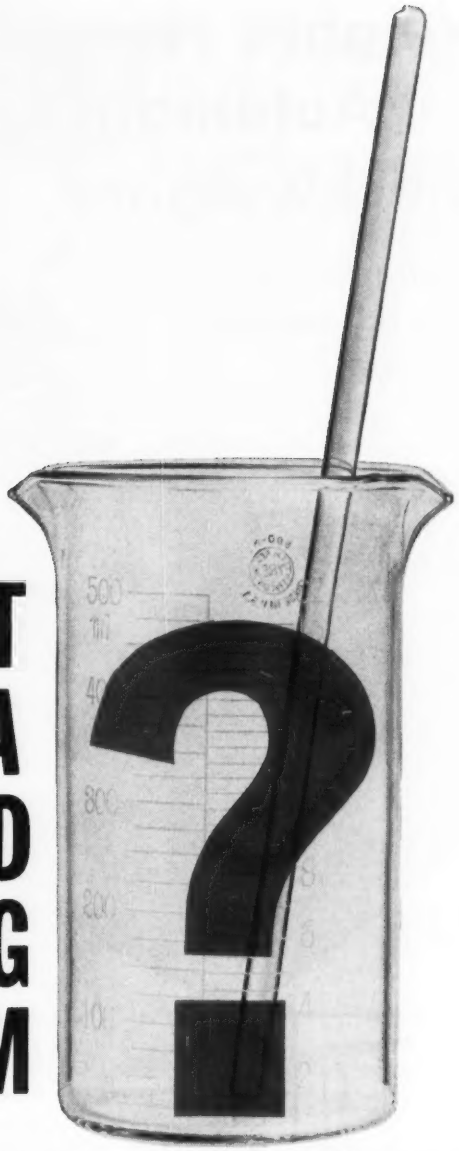

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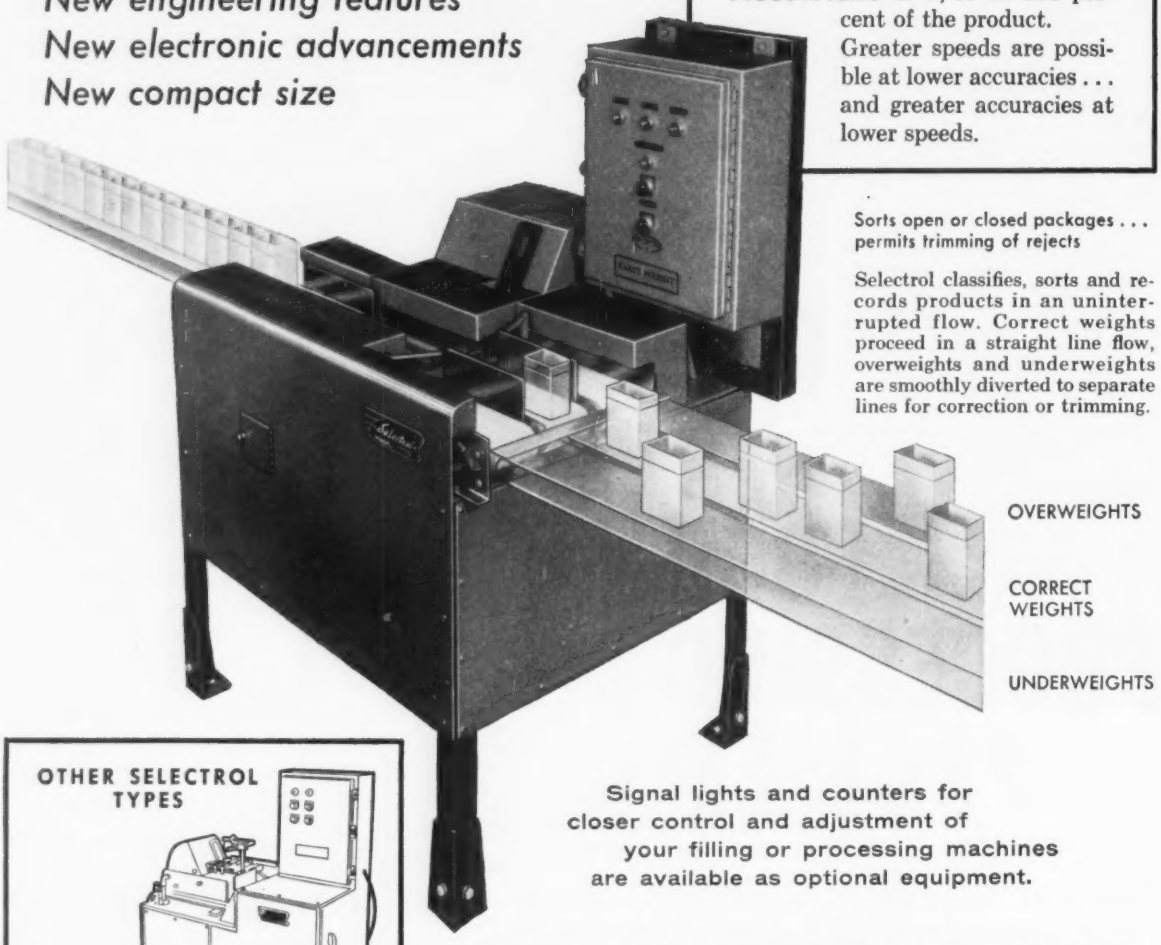

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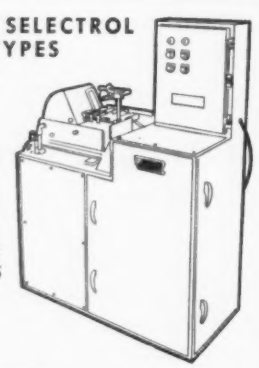

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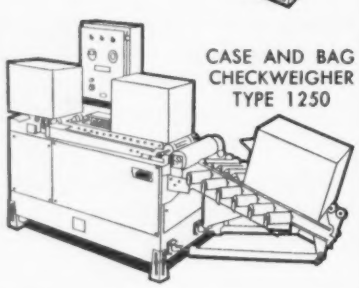

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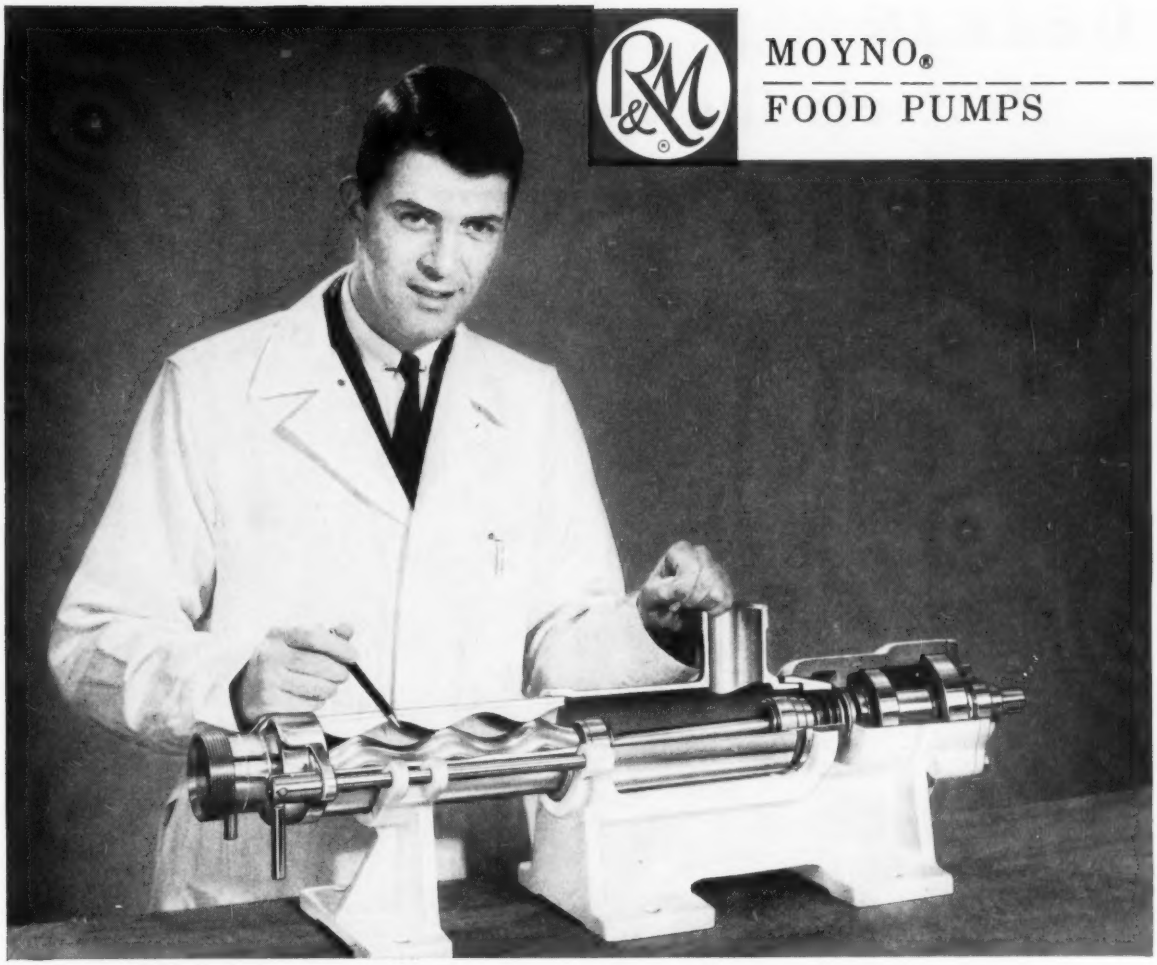

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Any food product that will move through a pipe—from cider to lumpy potato salad—can be pumped with a MOYNO. The *"progressing cavity"* principle that distinguishes MOYNO from all other pumps explains this remarkable capability. The cutaway model above shows the screw-like, reversible rotor that revolves in a double-threaded stator to create these progressing cavities. Material flows smoothly and uniformly, without pulsation, aeration, agitation or disintegration. All wettable parts are stainless steel—or stator may also be synthetic rubber, odorless bakelite or other material, depending on service requirements. If needed, off-the-shelf replacement parts are always immediately available.

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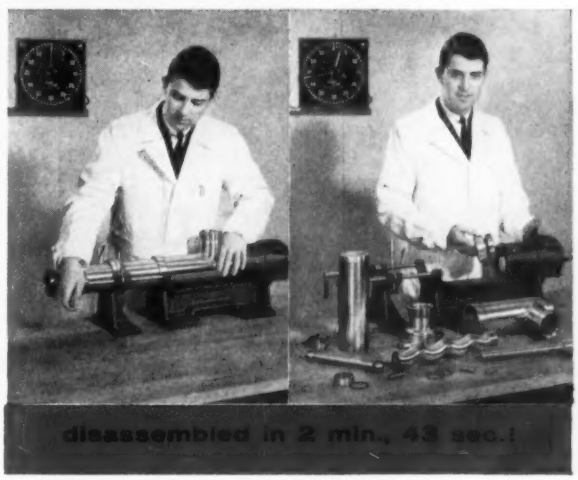

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DEVELOPMENTS TO WATCH

Use of antibiotic, aureomycin chlortetracycline, to keep fish fresh longer is approved by FDA—for fresh fish, shucked scallops, unpeeled shrimp.

Sodium nitrite dip on fresh fillets caused death of one consumer in Philadelphia area recently. This preservative is not permissible for fish in U.S.

Irradiation of foods in atomic power plant being built at Hallam, Neb., has been proposed. Heat transfer medium, liquid sodium, becomes radioactive, and would irradiate foods. Capacity is put at 520 to 800 tons a day.

Irradiation heat-sensitizes microorganisms. And 1.5 megarep gamma ray dose reduces heat-process time for canned ground beef at least 4-fold, research at University of Michigan reveals.

Beef rounds can be tenderized in 24 hr. at 110 F. if infused with antibiotic solution to control microbial growth. This is equivalent to 2 weeks at 35F., American Meat Institute Foundation researchers report.

Use of radioisotopes by food industry is saving $800,000 a year, for an investment of $32,000, according to National Industrial Conference Board.

Price of lysine, used to improve protein quality of foods, is cut 25% to $6 per lb. by Merck. Lysine monohydrochloride is used in cereals and specialty bakery products. Wider application is expected.

FDA approves use of methyl and propyl esters of p-hydroxybenzoic acid as preservatives up to 0.1% level. Claimed to be neutral in taste, these are produced by Chemo Puro Mfg. Corp.

New gas preparative chromatograph separates and collects purified components of complex samples in volumes 100 times as large as those prepared by analytical gas chromatographs. Beckman developed it.

Carnation uses small electronic computer to determine most economical formulation of poultry feed that will achieve desired nutrient value. Pet Milk used one to search out proprietary name for new product.

New Navy bread formula eliminates intermediate proof and machine molding operations. Less water, salt, and sugar are used. More yeast, shortening, and non-fat dry milk increase nutritive value.

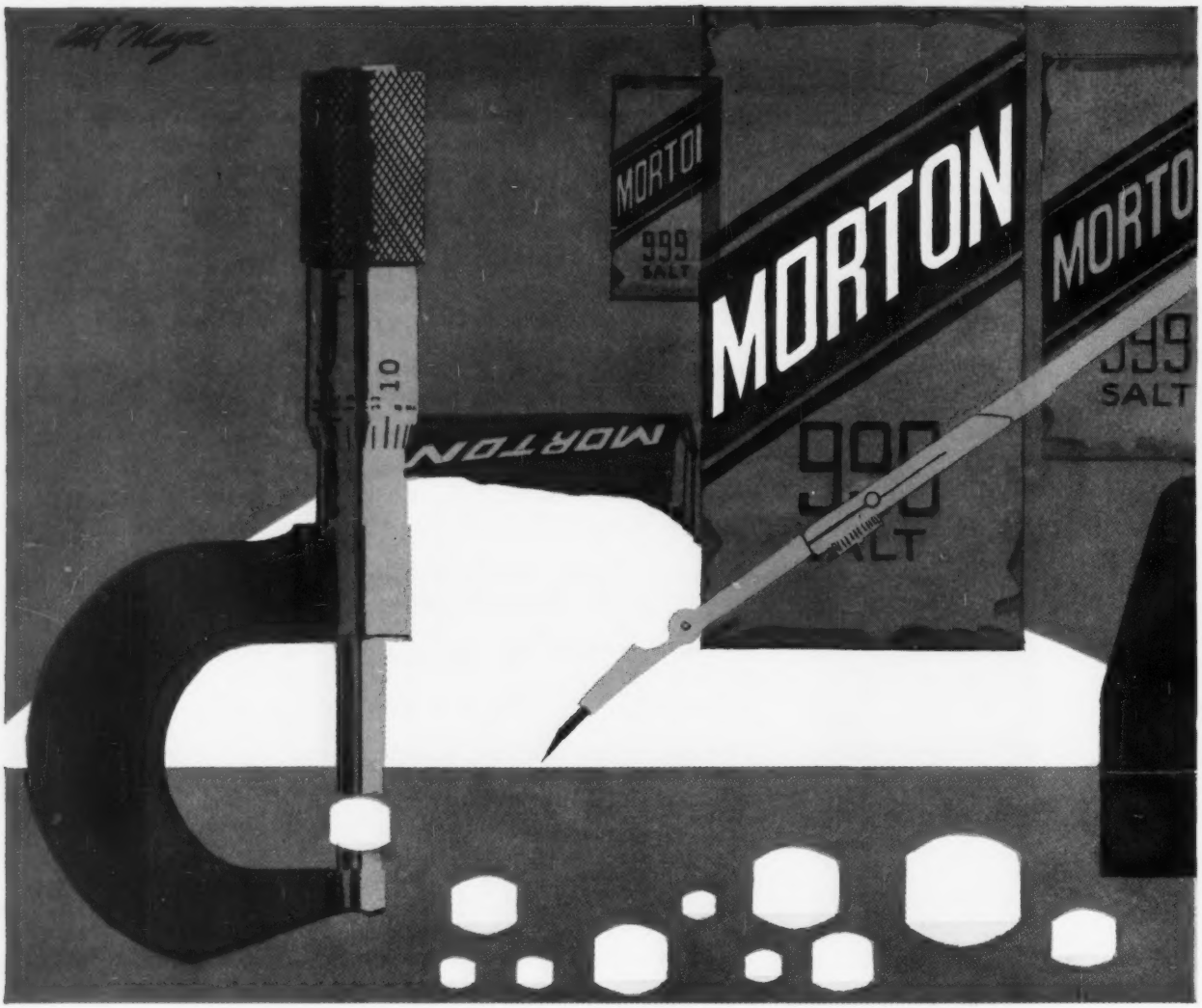
100% corn-oil margarine with cholesterol-depressant effect is Standard Brands innovation. About 80% of fatty acids in it are unsaturated, compared to 45% for butter. Flavor, spreadibility are good.

High nutritive value at low cost are attributes of significant new GF Horizon line. Now being market tested is casserole mix containing macaroni, cheese, and "protein kernels." Has meaty taste.

Economical new non-skid paper that permits higher stacking of bulk food bags is Armour Research Foundation development. Coefficient of friction is upped several fold by double-embossed interlocking-square pattern.

Strength of boxes at 90% relative humidity is upped 60% by treatment of corrugated inner core with low-cost liquid, high-polymer plastic, Vapon. Glidden uses it in making fiberboard.

Because potato flakes are big success, IFT Industrial Achievement Award goes to developer, USDA's Eastern Utilization R & D Div. Production of flakes in 7 plants may reach 25 million lb. in '59.



Only Morton offers you the right salt, in any form–

Morton '999' Salt is the highest purity salt commercially available everywhere in the United States. '999' is a low price, premium grade salt entirely free from bitter calcium and magnesium compounds that can distort flavor. Morton '999' is always 99.9% clean, pure sodium chloride, exceptionally low in the trace metals copper and iron.

What's more, '999' quality never varies from shipment to shipment whether you buy a bag or a carload.

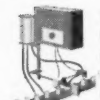
Morton also offers you high purity '999' Salt in handy tablet form. You get tablets that are always the exact weight, size and blend you require for accurate flavor control.

Morton combination tablets are precision made to your exact requirements. You can order Morton Salt blended in unvarying amounts with ascorbic acid . . . spices . . . citric acid . . . sulphur . . . M.S.G. . . . calcium chloride and other flavoring agents. Tablets come in 10-grain to 400-grain sizes.

Morton offers a complete line of tested and approved dispensers to help you reduce labor costs, eliminate waste and assure better flavor control through accurate dispensing of seasonings and preservatives. Technicians are available to help you select and install the dispenser or brinemaker best suited to your needs . . . to assist with initial use and provide regular follow-up maintenance to assure efficient, trouble-free operation that saves you time and money.

All dispensing and brinemaking devices are serviced by Scientific Dispensing Co. Division of Morton Salt Company.

and dispensing service to meet your special needs



The amazing Flocron Liquid Dispenser works electronically—remote controls permit you to "dial" the exact amount of liquid ingredients required for various can sizes. Handles up to 300 units per minute. Can be operated on existing equipment without revising existing production lines.

The Salt Tablet Depositor automatically deposits salt tablets in as many as 700 cans a minute. Guaranteed accuracy. Automatic models work on a "no can, no tablet" and a "no tablet, line stops" basis. Depositors come in special sizes . . . will place tablets in narrow mouth bottles, cans and jars.

The Morton Model-E Brinemaker is specially designed to produce up to 800 gals. of brine per hour from readily available '999' Salt. No space-wasting storage tank needed. No need for costly shutdowns for cleaning out sludge or impurities.

The Bulk Salter Machine dispenses salt, sugar, M.S.G., and other seasonings in dry form. Serves up to 400 cans per minute—if no can is present, no seasoning is released. Machine can be filled and supervised by unskilled labor.

Write today for more information!

We'll be happy to send you more information about high purity Morton '999' Salt... the Model E. Brinemaker... Flocron Liquid Dispenser... Bulk Salter Machine or the Salt Tablet Depositor.

MORTON SALT COMPANY

INDUSTRIAL DIVISION

Dept. FE-5, 110 No. Wacker Drive, Chicago 6, Illinois

MOST ADVANCED

insulated curtain wall of its type

and it's brand new on Butler buildings

Here's a fellow that's literally making construction history. In one simple operation he's erecting a complete exterior wall, finished inside and out—fully insulated—and ready for use as installed.

This revolutionary advance in curtain wall construction is made possible with new Butler Monopanl. It is the first factory-fabricated, factory-insulated panel that is factory sized to fit a pre-engineered structural system . . . and it is exclusive on Butler buildings.

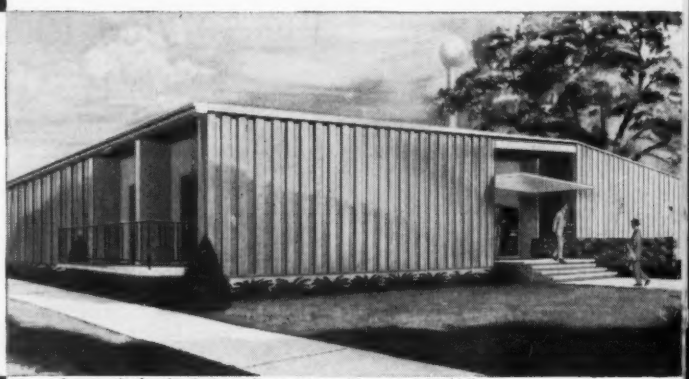
Today, even the largest Butler buildings can be enclosed in just days with handsome, slender—space-saving—curtain walls that permanently seal out weather and are equal in insulating ability to thick masonry.

Now, with new Monopanl, the Butler system of building is an even faster, better way to build . . . more than ever, the lowest-cost way to build well.

Call your nearby Butler Builder for full details. Ask him about Butler financing, too. He's listed in the Yellow Pages under "Buildings" or "Steel Buildings." Or write:

A Monopanl is literally a metal "plank" complete with decorative outer face, insulation and finished inner face. Complex configuration makes it the strongest panel of its type.

The unique double tongue-and-groove design creates strong panel-to-panel joints, permits push-together assembly. Vinyl gaskets seal out moisture permanently.



from a design by A. Francik and Associates, Architects

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WHO'S BUILDING WHAT...

Monthly Report: Food firms to spend $42,041,794 for expansion

Proposed Work

Amherst Dairy Inc., Buffalo, N. Y., $200,000 for dairy plant renovation and expansion.

Armour & Co., Murphreesboro, Ark., poultry processing plant, to cost $120,000.

Borden Co., Fort Wayne, Ind., ice cream factory on 7-acre site. Cost: $750,000.

Campbell Soup Co., Paris, Tex., food processing plant to cost $3,000,000.

Carling Brewing Corp., Halethorpe, Md., brewery costing $12,000,000.

Chariton Wholesale Grocery Co., Chariton, Iowa, warehouse addition to cost $500,000.

Interstate Bakeries Corp., Denver, 1-story bakery. Cost: $750,000.

McDonald Dairy Co., Saginaw, Mich., $1,000,000 ice cream factory.

Falls City Milk Producers Assn., Louisville, Ky., milk processing plant to cost $1,000,000.

My Own Quality Bakery, Fall River, Mass., bakery and storage area. Cost: $115,000.

Pillsbury Co., Jasper, Okla., $1,000,000 feed mill.

Quaker City Wholesale Grocery Co., Pannsanken, N. J., warehouse and office. Cost: $2,000,000.

Quaker Oats Co., warehouse to cost $250,000.

Samler Packing Co., Dayton, O., addition to meat packing plant. Cost: $125,000.

Southern Bakeries, Vidalia, Ga., bakery to cost $135,000.

Union Livestock Yards, Knoxville, Tenn., livestock processing building to cost $125,000.

Wenatchee Fruit Growers Assn., Wenatchee, Wash., fruit warehouse and cold storage building. Cost: $500,000.

Contracts Awarded

Morris April Bros., Vineland, N. J., packing and cold storage building. Cost: $145,300.

Canada Dry Bottling Co., Stamford, Conn., addition to bottling plant to cost $150,000.

Whatever your

PRODUCT

VISCOSITY

TEMPERATURE

PROCESS: BATCH or CONTINUOUS

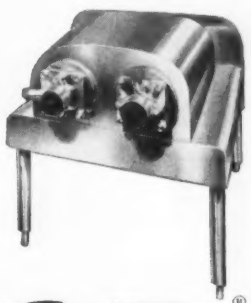
there's a CP®

HEAT EXCHANGER

to meet your needs

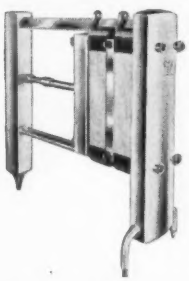
CP SERIES 90 VACUUM/PRESSURE WALL MULTI-PROCESS TANK

For Batch Operation with pressure unloading. Superior heating and cooling efficiency. Scientific agitation and matchless stainless steel construction. 300 to 1000 gal. capacities.



CP *Swept Surface*® TYPE

For High Heat, High Viscosity Operation — continuous heating (with hot water or steam) and cooling (with water, brine, ammonia or low pressure refrigerant) of liquids or semi-solids. Displacer-Mixer Blades sweep product from heat transfer surface for uniform, efficient —30° F. to 300° F., and over, performance. Stainless steel 1 to 4 cyl. models.



CP CRESCENT® PLATE TYPE

For Continuous Processing Operation — Cuts gasket cost over half. Compact, stainless steel units save space and speed production. Meet U.S.P.H. sanitation standards. Can be continuous heater, cooler, H.T.S.T. pasteurizer, regenerator or combination. Easy cleaning cuts costly wash up time.

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NEW...Tennant *Electric* Sweeper

SO QUIET you hardly hear it . . . so efficient it gets dirt other sweepers miss . . . so economical it often pays for itself in a year!

The new TENNANT "80-E" is all this . . . and *more*. It's exclusively "aisle-designed" to clean aisles up to 8½ ft. wide in one round trip. And in open areas it easily sweeps over 90,000 sq. ft. per hour. Cleans a 53" path with side-brush, 42" without.

You'll like its dependable battery power. Easily sweeps a full shift on a single battery charge (under normal operating conditions).

Economical. A real money-saver, too. Electricity usually costs less than other power. Upkeep is less. And an electric sweeper will generally last longer . . . especially when operating under dusty conditions.

WRITE TODAY *for illustrated bulletin.* G. H. TENNANT COMPANY, 767E N. Lilac Drive, Minneapolis 22, Minnesota.

TENNANT

Industry's Most Widely Used
POWER SWEEPERS

Model 100 Sweeper cleans 7'4" path

Model 53 Sweeper cleans 40" path

Model 40 Sweeper cleans 34" path

SPECIALIZED MAINTENANCE EQUIPMENT

Foremost Dairies, Los Angeles, modernization and expansion of plant. Cost: $1,500,000.

Friendly Ice Cream Corp., Wilbraham, Mass., ice cream plant to cost $1,000,000.

General Foods Corp., Newark, warehouse and offices to cost $1,000,000.

General Mills, Buffalo, N. Y., flour mill to cost $1,000,000.

H. W. Lay Co., Washington, D. C., $900,000 potato chip and confection plant.

M. Levin & Co., Philadelphia, banana processing plant to cost $500,000.

Libby, McNeill & Libby, Chicago, canned meat plant to cost $10,000,000; Yakima, Wash., canned goods warehouse to cost $135,000.

Meyer Packing Co., Sioux City, Iowa, 1-story meat packing plant to cost $144,000.

Northern Pacific Railroad Co., Seattle, 80 x 660 ft. produce terminal. Cost: $461,000.

G. M. Rasque, Pullman, Wash., dairy plant buildings to cost $270,000.

Richter Baking Co., Corpus Christi, Tex., bakery addition to cost $150,000.

Wachusetts Potato Chip Co., Fitchburg, Mass., manufacturing plant to cost $116,494.

Other Developments

American Tuna Canning Inc. plans a San Diego cannery.

Borden Co. will modernize newly acquired Dinsmore Dairy Co., Jacksonville, Fla. Plant capacity will be increased 25%.

Cargill, Inc. is constructing a soybean oil and meal plant at South Norfolk, Va.

Continental Nut Co.'s Chico, Calif. plant was destroyed by fire. Reconstruction has started.

R. T. French Co.'s Shelley, Ind., plant plans a $1,000,000 expansion program.

General Foods Corp. plans a 135,000 sq. ft. sales distribution center in St. Louis.

C. H. Musselman is adding a cold storage plant to facilities at Biglerville, Pa.

National Dairy Products Corp. has begun construction of a 100,000 sq. ft. 2-story laboratory in Glenview, Ill.

Oxford Royal Mushroom Products, Inc., has completed a mushroom growing plant at Kelton, Pa.

Star-Kist Foods has begun construction of new tuna cannery in Mayaguez, Puerto Rico. Handling capacity will be 100 tons daily.

For more data, circle 258 on Reader Service Card

For more data, circle 259 on Reader Service Card

Atlas Certified Colors

Industry's Standard for Over 100 Years!

FIRST PRODUCERS OF CERTIFIED COLORS

H. KOHNSTAMM & COMPANY Inc.

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For more data, circle 259 on Reader Service Card

What is the dimension of "the whole man?"

Meet William C. Durkee, Marketing Vice-President of Pepsi-Cola. He is a man of sizeable dimension, as measured by these responsibilities:

Quality Control — *Sales Promotion*
Plant Engineering — *Advertising*
Market Research — *Bottler Sales*
National Accounts

Bill Durkee's command moves into action via a team of management men on the plant floor and in the field. Together with the aggressive leadership of Chairman Steele and President Barnet, they have pushed Pepsi sales up from $40-million in 1950 to over $136-million last year.

The *whole* man? In this field you can't spot him by easy label. He can be marketing VP or plant manager, chief engineer or production superintendent. Or any of a dozen other titles. It's not the depth of his specialty that counts. It's the broadness of his interests, and how he thinks. *What he reads, too . . .*

There are many food management men, like Pepsi-Cola's Durkee, reading FOOD Engineering. They understand it. It understands them. They like it . . . because it is like them. Its job is *better management in manufacturing, packaging and marketing.* So is theirs. That's why it's "the complete magazine for the *whole* man".

For Better Management in Manufacturing, Packaging, Marketing

FOOD ENGINEERING

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Amazing the way Kelco Algin makes your products better

KELCO-GEL HV in Gels
makes high quality, sparkling clear, tender non-melting dessert and salad gels that have a fast, clean mold release.

KELCOLOID LVF in French Dressings
produces uniform and stable emulsions that look better and taste better. Shelf life is substantially extended.

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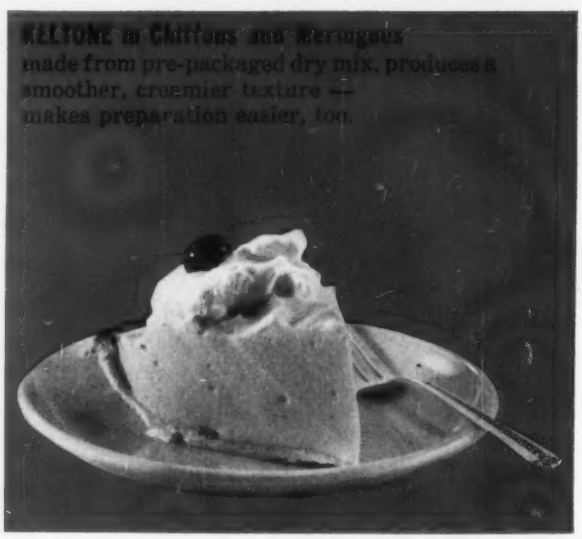
gives smooth texture, firm body for added taste and eye appeal.



KELTONE in Chiffons and Meringues
made from pre-packaged dry mix, produces a smoother, creamier texture — makes preparation easier, too.

—and enables you to develop new, improved products, too!

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WASHINGTON REPORT

FTC Hits National Tea and Kroger . . .

The Federal Trade Commission is cracking down on food chains without awaiting the results of its own current probe of food-industry economics.

In two new cases, it charges illegality in a whole batch of acquisitions by National Tea Co. and the Kroger Co.–targeting the former's adding of 13 corporations and their 440 stores since '52 and the latter's absorption of more than 40 corporations and their 1,900 stores.

Targeting unfair competition, FTC declares the programs of the chains "intensify" concentration of grocery store sales, and it notes that about 20% of the U. S.'s 385,000 food stores account for over 72% of the sales.

Under the Clayton Act, FTC can order the chains to divest themselves of the properties.

. . . And Industry Quickly Strikes Back

Immediately rebuttal to FTC's latest charges came from the presidents of some 60 top food chains. They loosed their blast following the wind-up of a Washington session of the National Assn. of Food Chains.

Terming the new moves "an unwarranted attack," G. H. Achenbach, NAFC chairman and head of Piggly Wiggly Sims Stores, contended that since '57 the large independent food stores have been increasing their share of total sales–while the chains got somewhat less.

Meanwhile, Kroger called the charges ancient history: Of the 1,900 stores involved in its case, only 132 were acquired since amendment of the Clayton Act's merger law in '50. The rest were added between '28 and '43.

Final Additive Directive Accents Safety

The new Food Additive Regulations, now officially released, particularly stress the definition of a safe additive and use of the controversial 100/1 safety ratio.

"'Safe'," states FDA, means that there is "convincing evidence establishing with reasonable certainty that no harm will result from intended use of the food additive."

And relative to the safety ratio: Except where "evidence justifies" a different measure, "a safety factor in applying animal experimentation data to man of 100 to 1 will be used."

FDA then listed 188 approved additives. Since this posting, industry has called for inclusion of 29 more.

Approval, meantime, has been given to 150 common seasonings and flavorings. But those of most critical interest–the synthetics–weren't included. Say insiders: "It will be some time before FDA's higher echelon finalizes them."

Pinpoint Brine in Poison-Fish Scare

On FDA's probe of that recent poison-fish scare in Philadelphia–

Uncleaned fish delivered to the Dan Diorio Fish Market didn't illegally contain any sodium nitrite—highly toxic when used in large amounts on fish. But some 1,800 lb. of fish subsequently going to stores did.

It was found that the fish was dipped in a brine solution before being packaged. But FDA wasn't yet prepared to say just how the chemical got in.

In small amounts, the nitrite has been used legally and safely for years in curing meats.

Calls for Notifications of Price Hikes

Under an anti-inflation bill, S-215 sponsored by Sen. O'Mahoney and pressed by Sen. Kefauver, many food processors' price rises would have to be justified to the government.

The measure would cover any firm with capital and surplus of $10 million in an industry in which 50% of U. S. sales are accounted by eight or fewer companies.

Apparently, food-field branches–as brewers, millers, and meat packers–would here be considered separate industries, and hence subject to the price checks.

In operation, firms would have to notify on proposed hikes 30 days in advance. FTC then would hold public hearings on the proposals. The Commission couldn't reject increases, but would rely on public opinion to temper them.

FDA Asks Funds for 121 New Jobs

FDA's budget requests for 1960 will–if approved–provide for establishment of 121 new jobs for administration of the new Food Additives Law.

These posts will generally go to chemists and pharmacologists. And a number of them have already been filled on the assumption Congress will Okay at least a good share of the request.

Meantime, however, the House Appropriations Committee has knocked $70,000 off the $374,000 that was asked for as supplemental funds for piecing out the current year. The '60 request is for $480,000 extra to handle the food-additives testing–salaries plus some lab equipment.

BRIEFS

Artificial red or green coloring of canned pears was slated for final FDA Okay early this month. NCA initiated the request last year.

That idea of a Cabinet-status Department of Consumers (FE Mar., p. 19) has progressed–such a bill having now been sponsored by Sen. Kefauver and 13 of his colleagues.

Adding wheat gluten to rolls and buns (FE Mar., p. 19) is now approved by FDA. Standard change was sparked by Hercules Powder Co., which purveys gluten ingredient tradenamed Vicrum.

Jurisdiction over atomic-fallout factors is seen being switched from AEC to HEW's Public Health Service. Heavy threshing in Congress hearings spark the change.

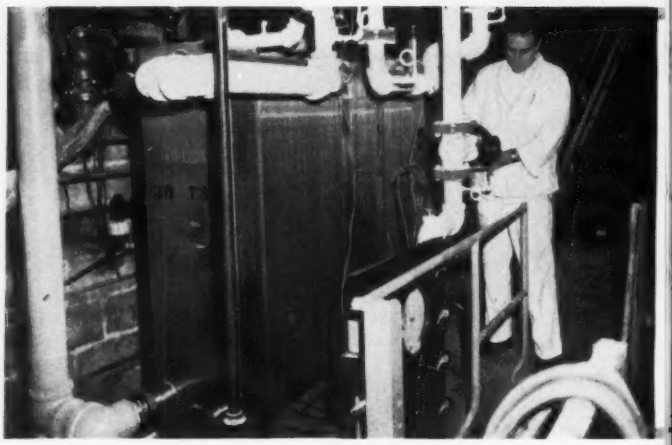
For more data, circle 261 on Reader Service Card→

Fred Wheelwright, Manager, Industrial Sales:

"One of the most pressing problems in the food industry today is upgrading processing efficiency. It's one of our specialties here at De Laval, and we go at it with a triple punch: outstanding engineering staff, the most complete processing pilot plant in the country, and a full line of outstanding process equipment.

"There are cases where it is relatively easy . . . replacing more traditional processing methods with modern, high speed and high capacity process equipment. Sometimes, it's only a part of the process that needs improving; in other cases, our engineering staff has developed a whole new system. (Note the panel dealing with the De Laval Potato Starch Process.)

"But whatever the problems . . . in heating or cooling, separation or recovery . . . we've found that we can almost always increase processing efficiency through careful selection of exactly the right process equipment. Our engineering staff and pilot plant facilities are at your disposal. And there is no obligation to you, of course."



THREE PROCESSING SOLVED WITH

For further information write to

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DE LAVAL PACIFIC COMPANY, Dept. F-2
201 E. Millbrae Avenue, Millbrae, California

BREWER GETS GREATER YIELD AT LESS COST WITH CENTRIFUGAL PROCESSING

The De Laval Wort Clarifiers illustrated here are removing trub from wort at efficiency never paralleled by more traditional methods.

Centrifugal processing not only detrubs wort more thoroughly than any other processing method, it also takes considerably less time. Because it is a completely mechanical process, it increases wort yield as much as 4% per brew!

The use of wort clarifiers eliminates the use of filters, ends costly filter pad and earth replacement. As you can see in the illustration, the space requirements of the wort clarifier are small.

Stainless steel or other non-corrosive metals form every part of the wort clarifiers that come in contact with the trub or wort. From brew kettles to fermenting tanks, De Laval Wort Clarifiers insure completely sanitary handling. All these facts help in producing a biologically clean and stable beer.

De Laval centrifugal separators offer the food processor unmatched efficiency (often greater yields), complete sanitary features, and space and labor savings. Send us a line describing your process. We'll gladly furnish you with descriptive literature which may well open the door to greater processing efficiency and reduced costs. No obligation, of course.

PLATE HEAT EXCHANGER ELIMINATES BACTERIA PROBLEMS IN COOLING MOLASSES

Traditionally, molasses has been cooled in open cascade coolers. This presented serious problems of contamination from air-borne bacteria.

Installation of a De Laval Plate Heat Exchanger completely eliminated these problems. The unit illustrated here cools 60 Brix sucrose from 180°F. to 157°F. as it circulates in counterflow to 67 Brix sucrose at 110°F. Another section further cools 60 Brix sucrose to 90°F. by means of 70°F. water.

The gasket-sealed plate pack is constructed entirely of stainless steel. The pack is easily opened for cleaning when necessary. The correct temperature is easily regulated and maintained, and the unit requires little or no maintenance.

If your process could benefit from the precision temperature control in either heating or cooling, or if the better than 90% efficiency in heat recovery and transfer would serve your process well, why not drop us a line? We'll gladly furnish you with full information and product details. And there is no obligation, of course.

PROBLEMS . . .
DE LAVAL PROCESSING EQUIPMENT

CENTRIFUGES • PLATE HEAT EXCHANGERS • VIBRATING SCREENS • COMPLETE PROCESSES

1 HOUR FROM RAW POTATO TO TOP-GRADE STARCH . . . WITH PROFIT IN BY-PRODUCT, TOO

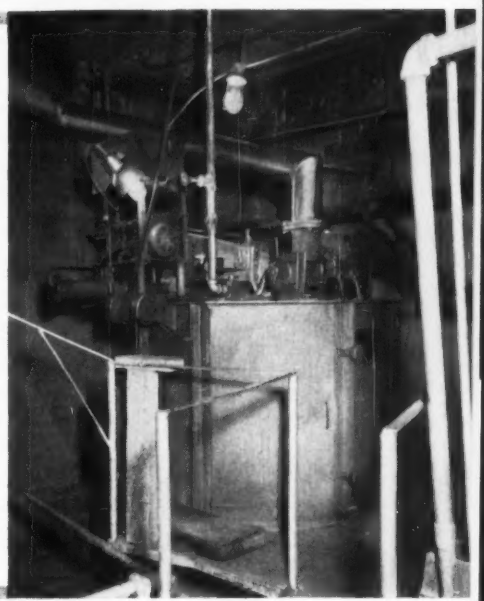
Automation came to starch production with the recent introduction of the De Laval Potato Starch Process. It means that in one hour, you get top-grade starch from cull potatoes with a minimum of labor, low power requirements, and incredibly low water requirements.

The De Laval Potato Starch Process recovers more starch than any other method from any grade of raw material.

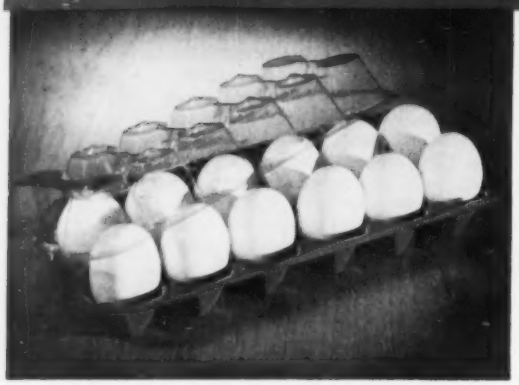
Even more, at the end of the process, the pulp produced is so dry that it is readily usable as cattle feed . . . a source of extra profit that can repay as much as 40% of the original raw material investment.

The entire process takes up very little room. This is important in keeping construction costs down on initial installation. In existing plants, it often allows for increased capacities without any additional construction.

This may not be the process which applies within your own field, but it does indicate the scope of De Laval's processing development work. If you feel that there is room for improvement in your present operation, why not contact De Laval? If it's a minor bottleneck or a whole new process, our staff and facilities are at your disposal with no obligation to you.



NEW PACKAGES & PRODUCTS



Functional and Attractive Carton

A unique egg carton from Kingston Products Corp. is offering multiple advantages to both consumers and retainers. The package consists of a molded clear acetate cover and a molded blue styrene tray.

The transparent top allows the consumer to inspect the contents. Knobs on the top of each egg compartment allow stacking of the cartons. The acetate can be printed with brand names.

The blue tray offers sales-boosting eye appeal when filled with white eggs. Being non-absorbent it is better for storing in moist areas than cardboard cartons. The study styrene also protects the eggs and reduces breakage.

Circle 1 on Reader Service Card

Markets 6-Flavors Instant Pop

New soft-drink tablets called Fizzies are proving to be a favorite with the kindergarten set. Made by Warner-Lambert Pharmaceutical Co. in six fiavors (orange, cherry, lemon-lime, strawberry, grape, and root beer), the tablets are simply dropped in cold water to prepare.

Molded with a cartoon face, each tablet is individually packed in a moisture-proof foil envelope. Sales unit is a strip of eight envelopes overwrapped to a cardboard backing.

The tablets are enriched with Vitamin C and contain only four calories. Sweeteners are Sucaryl and saccharin (in combination).

Introduce 100% Oil Margarine

The first margarine to be made from 100% oil is now marketed by Standard Brands. Called Fleischmann's Supreme, the new margarine is the result of extensive laboratory experiments.

Previously, all margarine has been mainly from vegetable oils which is soy bean, cotton seed, and peanut, either singly or in combination.

The new product was test-marketed in the upper New York State and New England areas.

Available in 1 lb. sizes, packed four quarters to a pound, the new table spread is packaged in five-color aluminum foil wrap.

Institutional Entrees for One

Combining the "boil-in-a-bag" concept with a new approach in institutional food service is Wilson & Co.'s Menu Pak entrees.

Individual portions of macaroni and cheese, welsh rarebit, creamed chipped beef, chop suey, pot roast, and other entrees are accurately weighed and sealed in strong, clear plastic film bags.

Special heating units use infra-red lamps to heat the portions.

Obvious advantages are waste reduction, uniformity in quality, variety, and savings in space and preparation equipment.

Divisible Carton Developed

A divisible corrugated box called Twin-Pac is one of the newest developments in bulk food packing.

Developed by Inland Container Corp. for Bunte Bros.-Chase Candy Co., the carton is designed to establish a unit of shipment that will encourage distributors to order each item in quantities of at least 2 doz., yet make it possible for the retailer to carry a maximum assortment with a minimum investment.

The carton consists of two equal-sized compartments, each with its own inner wall. Top flaps are sealed with adhesive or staples. Then the compartments may be separated by breaking along a dotted center line.

Circle 2 on Reader Service Card

Cake Roll—in 37 Minutes

Reported as the first cake roll to appear in packaged mixed form is Betty Crocker's chocolate cake roll mix.

The product "brings to the homemaker a new concept in dessert glamor and yet is faster and easier to prepare than a frosted layer cake."

Two mixes are contained in the package: chocolate cake mix and creamy marshmallow filling. The cake roll when completed is about ten inches long and yields ten large servings.

Included with the mixes are simple directions for making an aluminum foil baking pan.

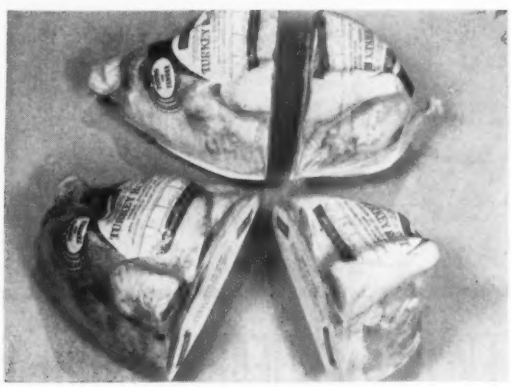
It take an estimated 71 minutes to make a conventional cake-roll and only 37 minutes with the mix.

Eat 'Em or Bake 'Em

Nestle's Butterscotch Toll House Morsels is now making its debut in grocery stores. Developed as an ingredient for cookies, fudge, sauces, frostings and desserts, the product may also be eaten directly from the bag.

The Morsels are bite-size drops of butterscotch, similar in appearance to Nestle's Semi-Sweet Chocolate Morsels.

The pouch package is faced with shiny white with a protective cellophane seal and a small window showing the product. Easy identification is provided by a bright plaid border. The reverse side is printed with recipes.



"Family-Size" Turkey Portions

Turkey leftovers may be a thing of the past thanks to Armour & Co.'s new Star Turkey Roasts. Roasts consist of quarter sections cut from young Tom turkeys averaging 18 to 22 lb.

In addition to having a choice of white, dark or mixed meat sections, the consumer may buy a "family size" portion of turkey. The roasts average 4½ to 5½ lb.

Fully table dressed, the product is packaged in tight-fitting plastic bags and hard frozen. The cut surface of the roast is further protected by waxed paper-board printed with cooking information. Roasts may be prepared from the frozen state or thawed.

Get more blending in less space...

SIX MERCHEN FEEDERS IN 120 SQUARE FEET

Compact W&T Merchen Feeders are easy to install and operate in crowded areas—can even be ceiling-hung. Space requirements are kept to the minimum without sacrificing precise control.

W&T Merchen Scale Feeders allow more efficient use of existing plant space. Without spending money for new space, you can increase production . . . regulate yield . . . control quality. By installing Pneumatic Merchen Scale Feeders, you get centralized control as well as recording and totalizing of production.

And your product quality is insured by the minute-to-minute accuracy of these feeders . . . each formula ingredient is accurately fed by weight into your blend.

Learn how you can save space and money with W&T Merchen Feeders. Write to Dept. M-43.37

WALLACE & TIERNAN INCORPORATED
25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

WATER ISN'T CHEAP ENOUGH TO WASTE

W&T controlled chlorination saves water and lowers treatment costs. You get maximum water value and use...even reuse.

Write for details on the new V-notch chlorinators: address Dept. S-137.37

WALLACE & TIERNAN INCORPORATED
25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

New Packages & Products

LATEST ADDITION to the family of Buitoni sauces is Heat-n-Serve clam sauce with tomatoes added. Product is a sister product to the white clam sauce introduced earlier.

Packaging Briefs

General Purpose Container for in store packaging is being supplied Piggly-Wiggly Corporation by Dixie Cup Div. of American Can Company. The 15-oz paper cup can be used with all types of lids. (3)

Textured Metallic Color for use in pre-applied labels has been developed by the Hazel-Atlas Glass Div. of Continental Can Co. Called Gilt-gold, color is now available commercially. (4)

Polyethylene Cellophane laminate called Durafilm is used in printed pouches used by Armour Creameries for its Miss Wisconsin cheese. Supplied by Dobeckman, the pouches eliminate machine malfunctions due to lip curl formed in storage. (5)

Standard Waxed Milk Cartons are the package for French Boy caramel corn. Waxed inside and out the carton holds 8 oz. of popcorn.

Circle key number on Reader Service Card

SALES-BOOSTING colored foil bags are now used for Carton House confections: cocoanut crunch, cashew crunch, and peanut crunch. Different color identifies each product. Supplier is Oneida Paper Products, Inc.

Circle 6 on Reader Service Card

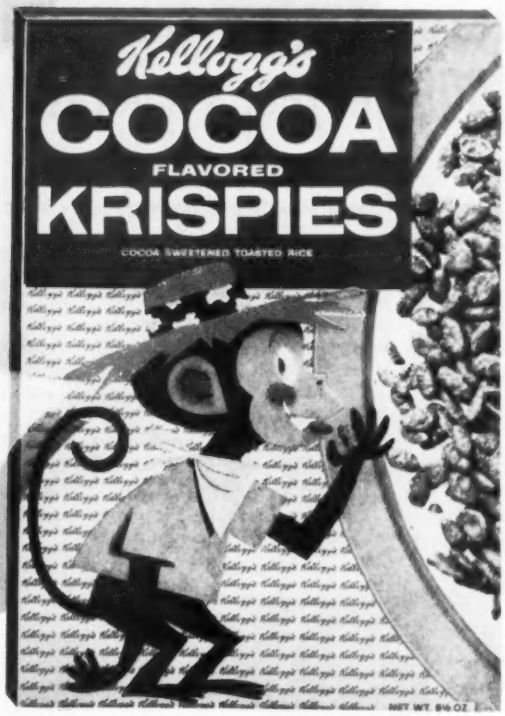
For more data, circle 262 on Reader Service Card

Just Between You and Your Customer

Customer confidence . . . key ingredient for repeat sales . . . requires carefully designed protective packaging that never lets the customer down.

This is Riegel's business: The research, the development, and the manufacture of highly technical packaging materials, designed first for protection . . . with equal stress on low cost, high packaging speed, and attractive appearance. More than 600 different Riegel materials now available . . . papers, foils, films and combinations . . . waxed, coated, plain or printed as your needs require.

Riegel research and Riegel versatility can help your sales. Write to Riegel Paper Corporation, 260 Madison Avenue, New York 16.



Riegel

PROTECTIVE PACKAGING MATERIALS

Kellogg's NEW Cocoa-Flavored Krispies is assured of full flavor retention and moisture protection by a special Waxed Cereal Liner . . . made by Riegel for high-speed forming and filling on Pneumatic Scale equipment.

For more data, circle 263 on Reader Service Card

STEPHENS-ADAMSON

BELT CONVEYOR system saves leading food processor up to $90,000 in year's operation!

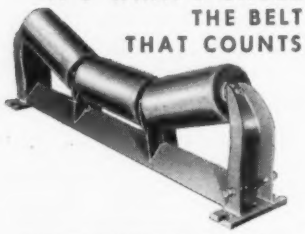
STEPHENS-ADAMSON engineers have a long-standing reputation for firsts — both for size and scope of engineered systems and for product features.

Typical of these firsts, is the World's Longest Grain Belt Conveyor, engineered for the A. E. Staley Mfg. Co., Decatur, Illinois, a half-mile belt conveyor system which has saved its owner nearly $90,000.00 in its first year of operation.

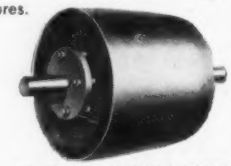
The conveyor system moves up to 224 tons of corn hourly — 192,000 bushels a day — from below the 12 million bushel capacity terminal elevator to the top of the processing plant holding elevator a half mile away.

Beside speeding corn handling to an equivalent of 100 grain cars per day, the installation provides a transfer system with better control, assures cleanliness of the corn, and eliminates spillage. Reduced handling costs per ton has resulted in considerable savings in over-all operating expenses.

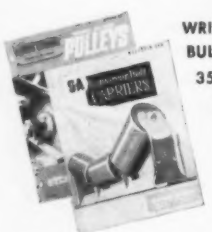
IT'S WHAT'S UNDER THE BELT THAT COUNTS



QUALITY ENGINEERED CARRIER
S-A manufactures a complete line of anti-friction carriers each providing a combination of exclusive engineering features.



S-A CURVE CROWN PULLEYS
Maximum belt training effect and minimum belt stress and wear are provided with patented S-A CURVE CROWN design.



WRITE FOR BULLETINS 355 and 558

S-A®
MATERIALS HANDLING PRODUCTS
SEALMASTER® BALL BEARING UNITS

ENGINEERING DIVISION
STEPHENS-ADAMSON MFG. CO.
GENERAL OFFICE & MAIN PLANT, 6 RIDGEWAY AVENUE, AURORA, ILLINOIS

PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
BELLEVILLE, ONTARIO

For more data, circle 264 on Reader Service Card

New Packages & Products

NON-STOP trip from processing line to consumer's dinner table is the advantage of this attractive spice and condiment shaker. Made of smooth foil, the package is made by Ekco-Alcoa Containers, Inc.

Circle 7 on Reader Service Card

New Product Shorts

Institutional Favorite, Hunt Foods' tomato puree is now available nationally for home use in the popular 10¼ oz. picnic size can.

Tangerine Juice is the newest fresh-frozen concentrate to appear under the Snow Crop label.

Pre-sweetened Cereal called Cocoa Krispies is new product of the Kellogg Co. of Battle Creek, Mich.

Caramel and Orange are the two new flavors just added to the pudding cake mix line introduced last year by General Mills.

Frozen rolls packaged in heat-sealed polyethylene bags have been added to the Topco Associates' line of frozen foods.

Blend of cinnamon, molasses, and peanuts makes up Keebler Biscuit Co.'s new Virginia Reel cookies.

Gefilte Fish has been added to Vita Food Products line.

Frozen Food line will soon make debut under White Rose label.

Blended Fruit Juices called AM and PM are new products from Duffy-Mott.

Baby Dinner additions in Beech-Nut Life Savers' line are strained turkey rice, beef and noodles, and chicken noodle. New junior dinners are lamb and noodles, turkey rice, and beef and noodles combination.

Vegetable Pie and vegetable pie with cheese sauce are now marketed by Seabrook Farms.

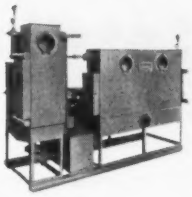
Coffee With Eggs added is new product of Livingston Coffee Co.

Three Flavors have been added to the Mars Inc. Marsettes line: mint, caramel, and cherry.

Rice for Gourmets, the result of a special process, is marketed by Comet Rice Mills, Dallas.

KATHABAR® SYSTEMS

Give these advantages to specifying engineers:



STERILE AIR

Now you can design spaces to maintain air sterility as scientifically as temperature and humidity. Only Kathabar enables you to calculate bacteria gain and maintain design limits of 5 micro-organisms per 10 cu. ft. or less, continuously.

DRY SURFACES

Permanently stop condensation on walls, floors, products. Dry up exposed water (bacteria breeding ground) no matter what your dry bulb. Results proved (you check) almost anywhere: breweries... candy plants... cereal plants... bakeries... sugar refineries. Name your required conditions (grains/pound and dry bulb) for process, storage, testing: Kathabar systems deliver.

GET FACTS

SURFACE COMBUSTION CORPORATION
2382 Dorr Street, Toledo 1, Ohio

Send facts on Kathabar systems for following application:

.....

.....

name & title .....

company .....

street .....

city ..... *zone* ..... *state* .....

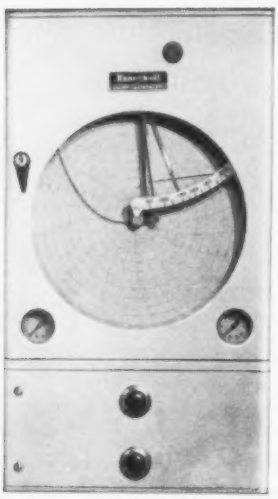
Surface

59-1F

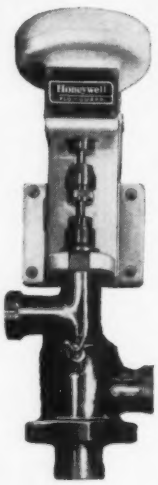
For more data, circle 265 on Reader Service Card

Let Honeywell controls bring you all

HTST PASTEURIZATION CONTROLS



THERMAL LIMIT CONTROLLER records and controls milk temperature to maintain pasteurization requirements. The thermal limit switch, recorder and control unit are compactly combined in one case, reducing panel space requirements, number of working parts and normal maintenance.

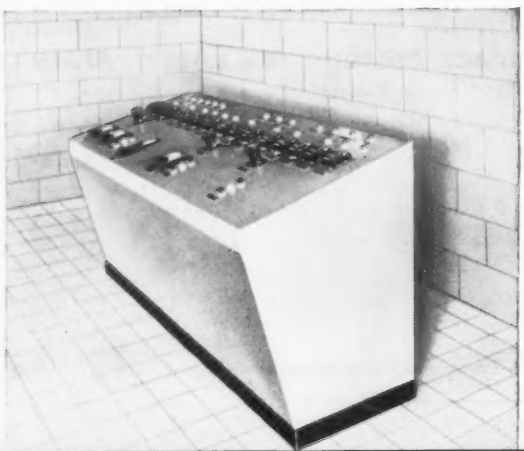


FLO-GUARD FLOW DIVERSION VALVE instantly diverts milk for reheating when the measured temperature drops below the required value. It passes milk in the forward flow direction *only* when milk is at or above pasteurization temperature. The valve is of clean, functional, sanitary design.

CLEAN-IN-PLACE CONTROLS

Temperature and timing control packages for automatically cleaning pipelines and process equipment provide:

- Record and control of solution temperature.
- Adjustable timing for rinse and wash cycles.
- Adjustable timing for drainage.
- Automatic sequencing of tanks, lines and valves.
- Remote operation and visual indication of process.

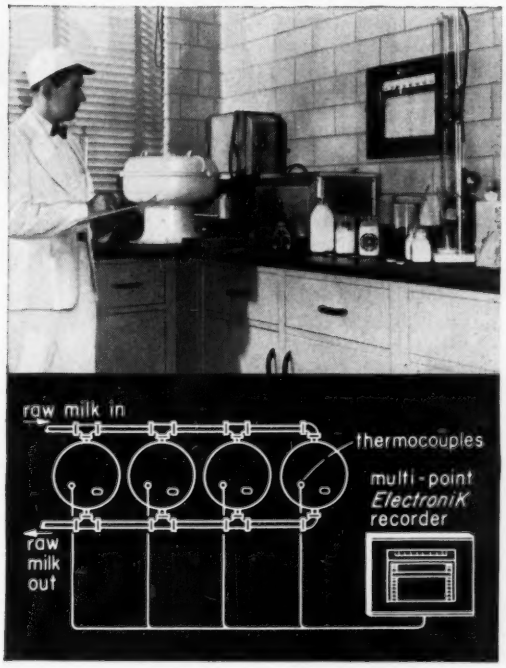


CENTRALIZED CONTROL SYSTEMS

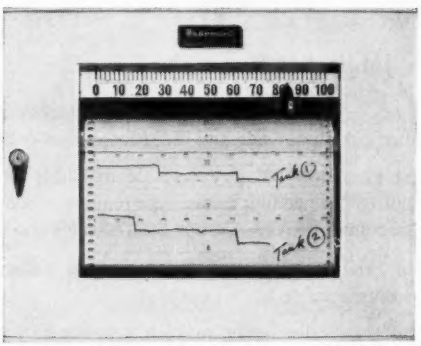
This control console offers the ultimate in automatic, centralized control. From this one location, blending and storage, standardization, and other operations can be sequenced automatically or manually.

the advantages of dairy automation

TEMPERATURE AND LEVEL RECORDING



MULTI-POINT TEMPERATURE RECORDER provides an accurate record of product cooling and storage temperatures at a number of points throughout the plant. This *ElectroniK* recorder uses either thermocouples or resistance bulbs as sensing elements, and records as many as 20 different temperatures on a single chart.



STRIP CHART SINGLE OR MULTI-TANK LEVEL RECORDER provides continuous record of tank fills, discharges, and total quantity. Record can be sequenced for a number of individual tank operations.

Consistently high product quality . . . more efficient plant operation . . . simplified maintenance . . . continuing, day-to-day economies. Gain these and all the other advantages of modern dairy automation with Honeywell instrumentation matched to the exact requirements of your plant.

From the world's largest line of automatic controls, Honeywell custom-designs complete control "packages"—systems to regulate virtually every dairy process, accurately and dependably. In bringing all of your plant operations under precise, centralized automatic control, these systems help you meet the strictest standards of nutrition and sanitation, with push-button ease.

An important extra you get with Honeywell instrumentation is truly complete service . . . in the design and selection of controls . . . during installation and startup . . . in periodic inspection and maintenance. And you can depend on Honeywell for swift help in emergencies. Wherever your plant is located, a Honeywell service engineer is always close by.

Your nearby Honeywell field engineer will be glad to discuss your instrumentation requirements. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

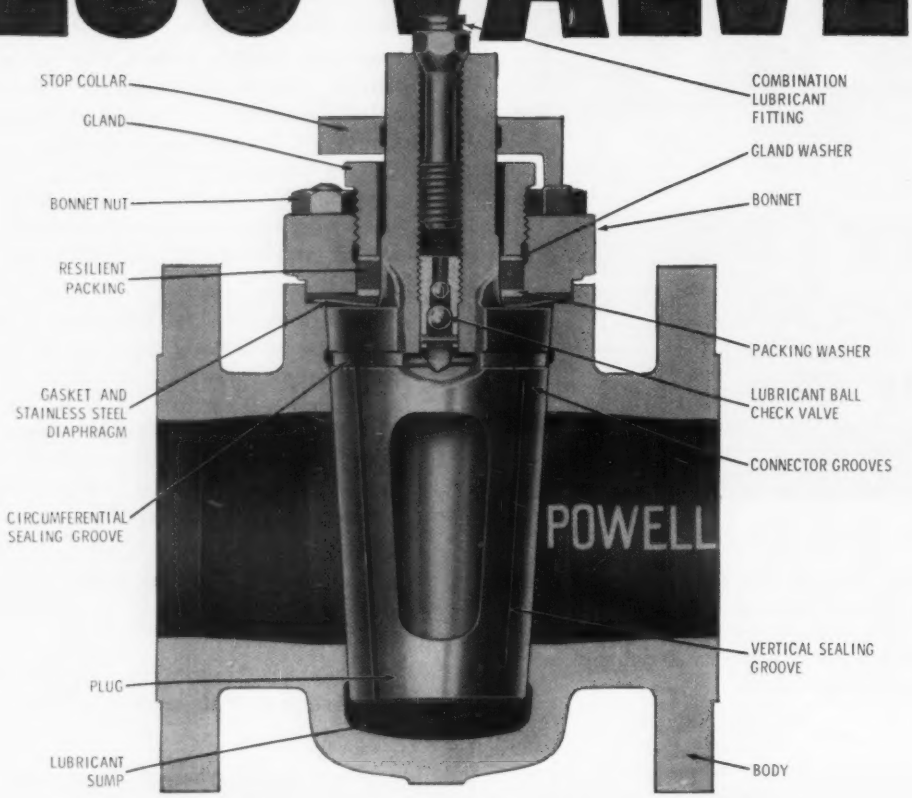
Honeywell

H HONEYWELL

First in Control

POWELL

LUBRICATED PLUG VALVES



Sectional view Powell Screwed Gland Lubricated Plug Valve.

Like all Powell Valves, Powell Lubricated Plug Valves are superior in their field . . . and have many advantages over other conventional types of Valves.

- Simple design: only three basic parts—Body, Bonnet, Plug.
- Quick, complete shut-off—a quarter turn will close or open the valve.
- Tapered Plug assures positive seating.
- Machined surfaces of plug and body are not exposed in the open position. Any media adhering to the plug when in the closed position is removed when plug is rotated.
- Cavity-free straight passage assures streamlined flow in either direction. Scale and sediment cannot collect.

Powell Lubricated Plug Valves are available in sizes ½" through 16", depending on the type required—Semi-steel 175 and 200 pounds WOG;—Carbon Steel ASA 150 and 300 pounds.

Powell can also furnish Lubricated Plug Valves in other alloys on special order.

For all your valve needs, make it a policy to consult your local Powell Distributor—or write directly to us.

THE WM. POWELL COMPANY

Dependable Valves Since 1846 • Cincinnati 22, Ohio

←For more data, circle 266 on Reader Service Card

For more data, circle 267 on Reader Service Card

Nothing Short of Total Packaging Concept Will Do

You hear much about the "total marketing concept" in food manufacturing. And you should, in these days of dynamic action on the selling front. But you should be hearing just as much about "total packaging."

Those who attended the recent AMA Packaging Conference and Exposition couldn't miss the fast-changing scene in packaging materials, containers, and machines. Nor could they fail to be impressed by the tremendous range of packaging knowledge required to keep abreast of progress.

Now add the implications of the new Food Additives Amendment as it applies to packaging materials coming in contact with the product. Then consider that the food industry spends some $7 billion a year on packaging materials and containers. Toss in the high labor and capital investment costs involved in the production side of packaging. Realize that both product formulations and processing methods often affect packaging requirements. Remember that the package must please retailers and be an effective silent salesman as well. And keep uppermost in mind that the consumer is paying for the product, not the package.

It is too complicated for one mind

Makes you dizzy, to be sure. Too much for one mind. It takes the combined know-how and creative ability of men serving each and every function in a food company—from top management to the laboratory technologist.

Anything this big, important, and complicated most certainly is a prime responsibility of top corporation executives. And the only way they can carry such responsibility successfully is to organize the packaging function. They must bring into play a team of experts whose combined skills cover all phases of food manufacturing and marketing. They must lead and inspire this team. And they must provide adequate research and production facilities.

In view of the high cost of successful packaging and the disastrous losses that can come from an inept operation, it is indeed surprising that many food firms are not organized in depth for better packaging.

Opportunities can be found in any area

This is not to advocate fancy packaging. Far from it. A principal task of the packaging team is to see that containers are as simple as is feasible.

A biscuit firm recently achieved surprising success with a new cooky packaged in a simple printed paper bag, the principal virtue of which is that it holds the product together. But the product is good, the package doesn't add much to its price, and consumers come back for more of this "good buy."

A cracker baker has effected tremendous savings by a simple fold-over seal on inner containers. This permits high efficiency on the production line, yet affords good product protection and convenience.

A powdered dessert manufacturer approached package simplification by restudying shelf-life requirements in today's fast moving distribution. Then it examined the process to see if more effective density control would simplify both packaging operations and container.

Opportunities to improve packaging can lie in any area. And potential benefits may spell the difference between profit and loss.

Don't fool around any longer. Put the total packaging concept into operation.

Building greater

consumer acceptance through

uniformly

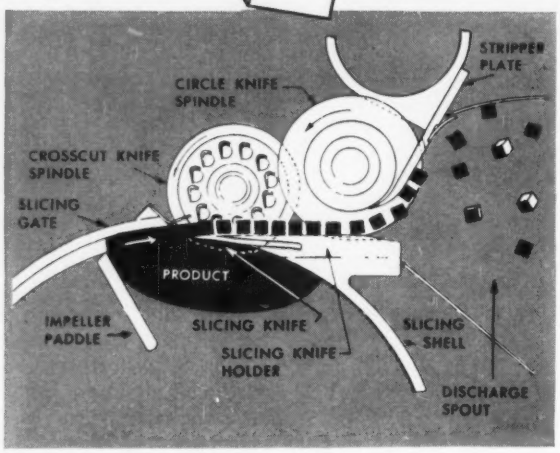
DICED

Peaches and Pears

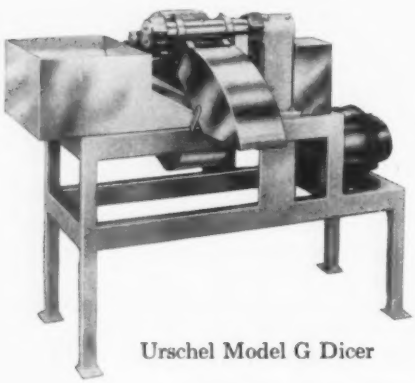
- One sure way to create greater consumer acceptance—and repeated sales—of your quality fruit pack is with the Urschel Model G Dicer.
- Stepped-up production is yours too, up to 8 tons per hour, when you dice your products on this unit. Consider this, too. The Model G adjusts for cuts of ¼" x ½" x ½", ½" x ½" x 1", ½" x 1" x 1", ½" x 1½" x 1½", or ½" cubes.

Not slicing peaches or pears?

- The Urschel Model G Dicer is ideal also for cutting pineapple, apples, potatoes, mushrooms, onions, cabbage, celery and peppers. Up to 11 tons per hour on these products. Complete details are available when you request Bulletin No. 5.



Simplicity and precision combine to provide uniformity in the Model G Dicer. Note the unique method of controlling the cut to prevent cracking by cutting parallel to the product strain.



Urschel Model G Dicer

Write:

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products

For more data, circle 268 on Reader Service Card

New B.F.Goodrich belt fights moisture that rots other belts

B.F.Goodrich "Green Pack" belt resists moisture, mold, fungi

THAT B.F.Goodrich belt has three times the moisture resistance of other belts used in the food processing industry. At the plant shown above, this new belt carries wet, diced celery. Belts previously used here were a problem. Water soaked into the belt, weakened and rotted the fabric reinforcement. Moisture also encouraged the growth of mold and fungi.

To protect against moisture, B.F. Goodrich engineers developed a special treatment for conveyor belts called "Hydroseal". This treatment is applied to the fabric reinforcement, where it penetrates every cord, giving maximum resistance to moisture. Each of the fabric plies is also coated with rubber for additional protection.

This new B.F.Goodrich belt is more sanitary, too. It is the first to be made with a special rubber compound containing an inhibitor that resists most fungi and molds, keeps them from forming on the belt cover.

Food inspection is easier, more accurate because of the belt's light green color, a shade selected by color experts as being easiest on the eyes. The color is not just a surface coating. It is used throughout the belt, cannot fade or be rubbed off. Belt surface is extra smooth, so it won't trap dirt, is easy to clean.

Your B.F.Goodrich distributor has full information on the new B.F.Goodrich "Green Pack" belt and can tell you about its many other advantages for food-handling operations. *B.F.Goodrich Industrial Products Co., Dept. M-584, Akron 18, Ohio.*

B.F.Goodrich *conveyor belts*

For more data, circle 269 on Reader Service Card

What you should know about

Is your box a delivery boy

There's a whale of a difference. It usually shows up on the sales charts.

Did you know, for example, that some products' sales have increased substantially *after* their containers were redesigned *visually?* And consider this: A single corrugated box, in an average service lifetime, can meet and influence hundreds of people. Since you've paid for this valuable display space, why not make the most of it?

Plant . . . to point-of-purchase

Colorfully printed corrugated boxes work hard for you in dozens of ways. You can use them to promote your brand name—create a "personality" for your product—add point-of-sale impact. Your designs can tie in with special and seasonal promotions and events —or your advertising. They can help develop dealer preference by speeding identification, simplifying inventory control. Even on factory warehouse shelves good-looking boxes do an important in-plant merchandising job.

Choosing the design

The type of design and color to use will be governed by the specific marketing needs and the product itself. Is it an industrial . . . a staple . . . a luxury? Should the mood be

design and printing of Union boxes

...or a traveling salesman?

gay . . . warm . . . dignified? Is it desirable that the design be adaptable to family packaging?

Union's Package Design Department will be glad to analyze each of these factors for you, help you take maximum advantage of the many merchandising opportunities your container offers.

Making the right impression

How well your box design succeeds as a salesman depends largely on how it is reproduced. And printing on corrugated is an exacting science. Roll pressures, for example, must be light enough not to damage or weaken corrugations... yet heavy enough to insure clear, crisp impressions that will stand up (and stand out) even under the severest handling and shipping hazards.

The tools for the job are critical too. Today, flexible printing plates have been perfected so that they can be tailored to the specific job to be done. There are new moisture-set and oil-base inks to choose from as well as new precision machines for the actual printing. When these developments are teamed with the bright, smooth surface of Union containerboard the result is a corrugated box that gives you the best in protection for your products and merchandising for your brand.

Ask to see samples of what has and what can be done. Union's artists and pressmen have produced outstanding designs for some of the country's largest and most discriminating box users. Their services and talents are at your disposal.

Precision presswork. Modern machines automatically print, score, slot and stack box blanks — in one fast operation.

Hardworking designs quickly identify contents including brand, size, count, code number.

An experienced art staff is at your service. Specially trained to get the most out of corrugated printing, they can help you achieve maximum merchandising impact with your box.

Write for new informative booklet, "Printing of Corrugated Boxes."

union camp

UNION BOXES

UNION BAG-CAMP PAPER Corporation
233 BROADWAY, NEW YORK 7, N. Y.

Factories: *Savannah, Ga.; Trenton, N.J.; Chicago, Ill.; Lakeland, Fla.*

Sales Offices: *Eastern Division — 1400 E. State Street, Trenton, N.J.*
Southern Division — P.O. Box 570, Savannah, Ga.; P.O. Box 454, Lakeland, Fla.
Western Division — 4545 W. Palmer, Chicago, Ill.

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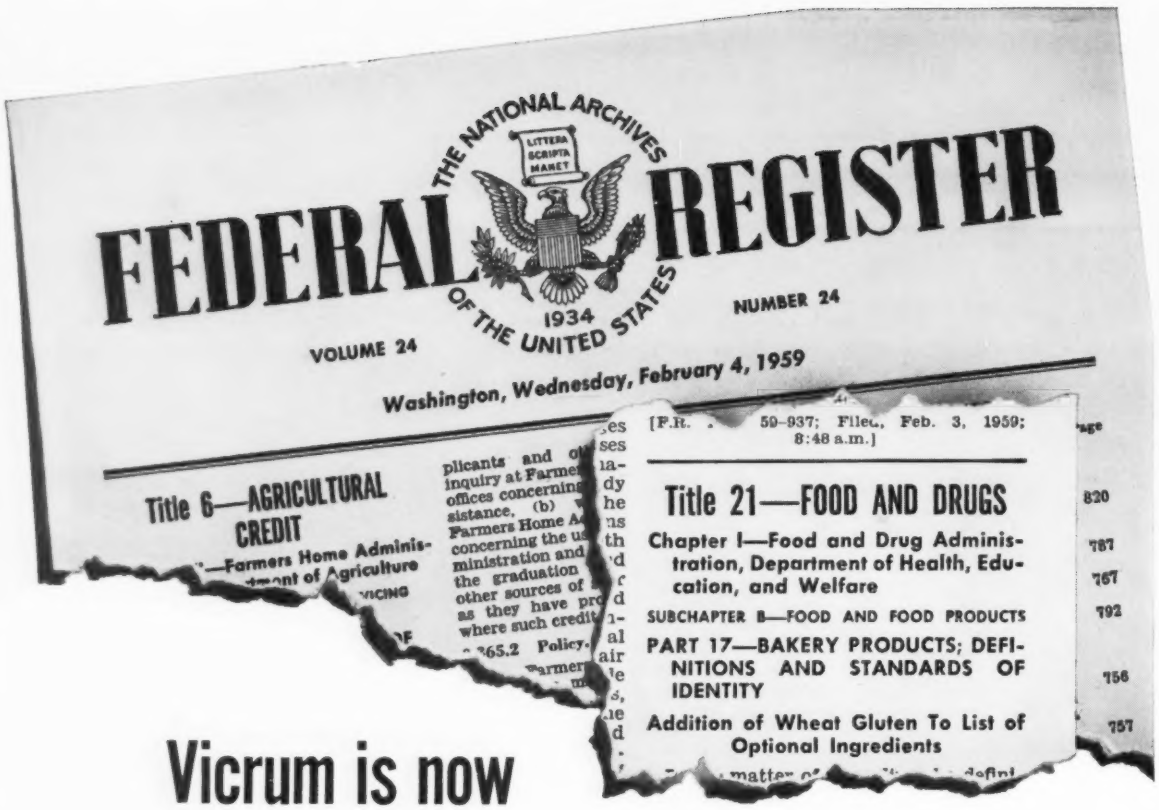
THE NATIONAL ARCHIVES
LITTERA SCRIPTA MANET
FEDERAL REGISTER
OF THE UNITED STATES
1934
VOLUME 24
NUMBER 24
Washington, Wednesday, February 4, 1959
Title 6—AGRICULTURAL CREDIT
[F.R. . 59-937; Filed, Feb. 3, 1959; 8:48 a.m.]
Title 21—FOOD AND DRUGS
Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare
SUBCHAPTER B—FOOD AND FOOD PRODUCTS
PART 17—BAKERY PRODUCTS; DEFINITIONS AND STANDARDS OF IDENTITY
Addition of Wheat Gluten To List of Optional Ingredients

Vicrum is now Permitted in Rolls and Buns

This amendment to the Bread Standards, which became effective April 5, 1959, permits the use of Vicrum (Hercules Vital Wheat Gluten) in rolls and buns, enriched rolls and buns, raisin bread, raisin rolls and buns. The amendment limits the use of Vicrum not to exceed up to 4 parts of wheat gluten for each 100 parts by weight of flour.

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FOOD ENGINEERING
FOR MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

VALUE OF TREATMENT has been demonstrated by shipboard experiments in which tagged freshly caught fish were placed in tanks of ice containing the chlortetracycline.

THE SPECIAL ICE, prepared by adding dry formulation of antibiotic to water in tank, is easily recognized by its yellow-green color.

Antibiotic Now OK for Fish

FDA approves use of chlortetracycline on fresh seafood after 3 years' satisfactory experience with poultry and extensive lab checks. See first use in special ice on ships

A NEW FOOD DIMENSION will now be supplied by antibiotics. For the one known as chlortetracycline—which has helped extend shelf-life of fresh poultry since 1955—may now be used on fresh fish.

▶ **Concluding that the experience with poultry had proved this antibiotic harmless when used in limited amounts, FDA on April 14 OK'd a petition by American Cyanamid Co. for use of chlortetracycline at 5 ppm. on fresh fish, shucked scallops, and unpeeled shrimp. Clearance was under Miller Pesticide Bill.**

Processed seafoods such as fish cuts, steaks, fillets, peeled shrimp, and shucked oysters were not included. So the company is expected to file a separate petition for use on processed fish.

A Look at the Background

For more than three years, antibiotics have been used as a dip for fish fillets in Canada. This treatment has more than doubled their shelf life—enabling shipment of cod fillets, for example, from the east to the west coast by rail under regular ice refrigeration.

During the same period, it is estimated, more than ½ billion pounds of fresh poultry have been treated with the antibiotic in the US.

In addition, extensive experiments have been conducted on fish with ices, dips, and sprays containing the chlortetracycline (FE Jan. '56, p. 46). Antibiotic ice was found to fit most generally with present-day operations aboard ship.

Although FDA's approval is for use as a dip or as an ice by commercial fishermen on fresh caught, whole, headed, and gutted fish, major anticipated use of the antibiotic is in an ice.

Manufacture of this special ice is quite simple. Block, flake, or chip ices containing chlortetracycline are prepared by freezing solutions of Acronize. For block ice, a dry formulation containing not less than 16½% antibiotic in combination with a protective colloid and a salt is added to the water.

The colloid causes formation of a gelatinous network throughout the solution. Herein, the antibiotic is fixed by the binding action of the salt. Resulting ice, containing about 5 ppm. chlortetracycline, has a very pale, uniform greenish-yellow color.

Application of the antibiotic ice is recommended for chilling fish under customary conditions. For added protection, it has been found effective for re-icing fish when necessary, and may permit transportation over greater distance.

Doesn't Bypass Sanitation

As in the case of poultry, antibiotic treatment of fish is no substitute for sanitation. It cannot make bad fish good. But it can make good fish remain good longer by retarding bacterial growth.

Following the procedure set up for fresh poultry, American Cyanamid plans to exercise control in the marketing of Acronize to insure highest quality of the fish. Technical service men of the company will maintain a periodic check of the methods of application, and the sanitary performance of those using the antibiotic.

In addition, the company has prepared a complete set of QC standards for ship operators, ice manufacturers, and fish processing plants.

—FE Staff

"Ray-Pasteurizing of Produce Will

So says QM food-radiation expert after special trials prove need of "threshold tactics" to guard against detrimental effects . . . Specific dosage tests revealed on numerous fruits and vegetables

PRIMARY PURPOSE of irradiating fresh fruits and vegetables is to reduce their surface microbiological flora, thereby cutting down post-harvest disease and increasing storage life.

Here, the foods' original values can be maintained by utilizing low-level irradiation as an adjunct to controlled temperatures and humidities. However, the dosage must be below a "threshold level" (above which detrimental texture, color, and appearance changes occur).

In many tests, which have included numerous samples inoculated with a wide variety of typical spoilage microorganisms, it has been noted that dosages needed for complete kill of plant pathogens run well above the threshold.

• **It appears, then, that optimum radiation control lies in pasteurizing the produce, rather than sterilizing it. And the first commercial food irradiation likely will be use of low dosages to extend refrigerated shelf-life.**

Safe and effective dosages lengthen holding periods either by partially inactivating the infecting organisms, or by extending the latent period of infection. The dose received, temperature of storage, and age of infection bear a direct relation to length of holding time without incidence of infection or visible radiation injury.

Fruits and vegetables evidence ray-sensitivity by softening and other texture aberrations. For such products as canning peas, asparagus, and pie apples, where a tenderizing effect is desirable, this effect is thought advantageous.

An increase in ripening has been noted as a maturation effect in peaches as a result of radiation. In green or pink tomatoes, however, one laboratory observed a pronounced delay in maturation.

Low level doses can significantly extend refrigerated shelf-life of blanched vegetables. It's conceivable that blanched vegetables, properly packaged and kept at refrigeration temperatures, could be retailed much as are frozen vegetables.

Significant findings resulted from studies to determine effects of product characteristics, irradiation conditions, and pre- and post-irradiation handling on radiation-pasteurized produce. Sealed cans bulged with gas after standing for several days. However, there was less gas in cans of irradiated foods than in cans containing the unirradiated controls.

Both variety and culture appear important from the standpoint of irradiation sensitivity, as was shown in irradiation of strawberries. A California varietal type grown in Utah showed greater resistance to tissue breakdown than the same berries grown in California. Marked varietal differences also were reported in potato-sprout inhibition.

Attempts have been made to reduce the necessary dose by pre- and post-radiation treatment with chemicals known to be inhibitory to microorganisms. In many cases this has resulted in objectionable sensory characteristics, without inhibition of microbiological growth.

It has been found that produce packaged in porous or perforated materials (rather than in hermetically sealed containers) can be maintained at a higher quality and over a longer period of time. The same held true for the irradiated produce.

Asparagus, tomatoes, snap beans, and strawberries that were irradiated while being flushed with air were preferred to the control samples in sealed cans.

Specifics on Fruits

Bananas: Irradiation of whole bananas reduces the rate of internal softening and accelerates skin blackening. A dose of 14,000 rads increased the shelf-life—the irradiated fruit being firm and satisfactory after 30 days' storage, while the control had softened completely. Ripening of hard green bananas is appreciably delayed by 37,000 rads.

Berries: Black currants given 93,000 rads definitely softened. At 186,000 rads a bleaching was noted. And at 930,000 there was definite loss of the typical sharp flavor. Irradiation in the frozen state partially protected the flavor.

Red currents and raspberries softened under 93,000 rads. Bleaching and a loss of sour flavor occurred at approximately 460,000 rads. With frozen berries, irradiation markedly protected color. However, texture quality decreased.

Berries taking over 460,000 rads were of unsatisfactory flavor. But the unpleasant flavor was averted by soaking the fruit in a 0.1% solution of potassium metabisulfite and draining before radiation. This treatment did not, however, protect color, texture, or natural flavor.

Combination of gamma rays (186,000 rads) and refrigeration notably prolonged storage life of naturally infected strawberries by delaying rot. Higher dosages (e. g., 465,000 rads) caused marked softening and bleaching. The refrigerated shelf-life of unirradiated strawberries was 62 days, whereas those irradiated at 1.4 megarads kept for 128 days—more than double.

As many as 93,000 rads can be given cranberries without tissue injury. But this dose doesn't appear to prevent further development of rot-inducing organisms that attack cranberries in storage.

With gooseberries, softening was evidenced at 93,000 rads and loss of typical flavor at 465,000. At 930,000 rads, irradiation flavor was produced, and bleaching occurred at 3.72 megarads. Flavor of gooseberries was notably aided by soaking in 50% sucrose after blanching.

Refrigerated shelf-life of blueberries given 140,000 rads was 162 days, against 70 days for the unirradiated controls. Spoilage of berries was probably autolytic. Irradiation and storage caused reddening of the berry flesh. Further, the vitamin-C content was significantly reduced.

GERALD D. GERNON, JR.

Technology Branch, Food Radiation Preservation Div., QM Food & Container Institute for the Armed Forces, Chicago. Accompanying article is designated as Publication 1001. Views are those of author.

Come First"

Citrus fruits: Although storage life has been notably prolonged, 93,000 to 186,000 rads are not generally sufficient to kill all surface flora of whole fresh lemons and oranges.

Where such fruit was under severe penicillin-infection conditions, 140,000 rads were found optimum for shelf-life extension at incubation temperatures of 70-75F. without radiation-induced physiological breakdown.

Lemons could be held 11 days without adverse effects, whereas under cold storage this period was extended to a minimum of 14 days for this fruit, and over 33 days for oranges. Development of ray-induced brown injury and textural changes was more successfully controlled by low-temperature storage for oranges than for lemons.

Important flora after irradiation are the *Alternaria citri* ("black rot"). The fruit becomes more susceptible, apparently due to rind breakdown and textural change caused by gamma rays. At higher doses, lemons particularly become soft and discolored. Internal injuries (watery texture and hesperidin crystals) were found in the pulp of Florida Valencia oranges that took 900,000 rads (but not those receiving 450,000 rads).

With grapefruit, no appreciable loss of acceptability characteristics occurred under doses as high as 465,000 rads.

Grapes: Application of 465,000 rads appeared to control *Botrytis cinerea* (inoculation) in Tokay grapes without much adverse effect on the fruit. At 465,000 and 930,000 rads, no rot was noted 10 days after inoculation. Rot, however, was evident in the controls in 4 days. The only sensory changes evident were a fermentation odor and flavor at the 930,000 dose.

Apples: With three varieties of apples, 50,000 rads were highly effective in extending refrigerated life. Samples inoculated with *Penicillium expansum* required 93,000 rads for significant reduction of rot. And it took 186,000 to check rot in fruit held at 70 to 75F.

Dosages of 279,000 to 930,000 rads caused visible damage to the apples—as internal core breakdown, browning of skin, and texture softening. The control apples had rotted completely after 10 days of storage, whereas all rayed apples (doses as noted) were unrotted.

Irradiated apples slices deteriorated in flavor, color, and texture during storage. Slices irradiated to 930,000 rads were less preferred than those given 465,000. And slices from rayed mature apples were judged better than those from the immature.

Apple juice exposed to 930,000 rads had excellent flavor. But marked bleaching was noted at doses as low as 279,000.

Pears: Under higher-level doses (up to 744,000 rads) Bartletts suffered immediately in appearance, color, and odor (amount dependent on dose). At up to 200,000 rads, however, rayed mature Bartletts were similar in sensory characteristics to unirradiated pears. Green Bartletts, after taking up to 300,000 rads, showed good quality after 7 days incubation at 70F.

Stone Fruits: Apricots irradiated to 300,000 and to 500,000 rads at 100F. showed some shriveling, but were considered to be in good condition after 45 days' storage at 40F. The non-rayed controls and those given but 100,000 rads were shriveled and infested with mycelium (bread-mold type of fungus growth).

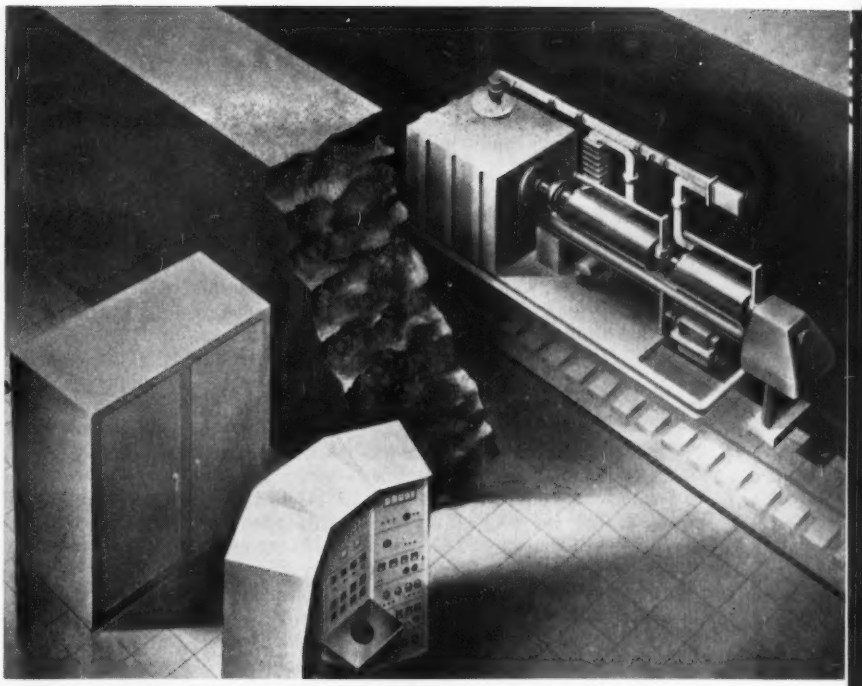
Little change was seen in acceptability characteristics of cherries given doses up to 3.72 megarads. The refrigerated shelf-life of unrayed sour cherries was 98 days, whereas those taking 1.7 megarads were still satisfactory after 191 days. Studies indicated that 100,000 rads would be suitable for mold control.

Pasteurized raw peaches inoculated with *Phizopus nigricans* were free from infection 10 days after treatment at 230,000 rads and 6 days after treatment at 140,000 rads. Non-rayed controls rotted completely in 5 days. Doses above 280,000 rads brought textural and skin-color abnormalities.

Dosing of plums at somewhat less than 372,000 rads did not alter their acceptability characteristics.

Pineapple: Blanched and unblanched pineapple chunks exposed to 740,000 and 930,000 rads suffered severe flavor changes. Chunks given 46,000 and 93,000 rads showed a slight reduction of bacteria organisms. Objectionable off-flavor developed in this fruit when the dosage reached 93,000 rads.

Rhubarb: Stems of rhubarb given



New Unit Will Ray-Pasteurize 6,000 Food Packets Hourly

Global scale of food-irradiation research is evidenced by word that the Danish Atomic Energy Commission has ordered a powerful new 10-mev. linear electron accelerator (depicted here in an artist's conception). It will be installed late this year in Copenhagen's Niels Bohr Laboratory.

Being built by Varian Associates (Palo Alto, Calif.), this unit will be capable of pasteurizing 6,000 lb./hr. of prepackaged foods, using ½-megarad doses.

Seen in foreground are control panel and cabineted pulse modulator. Behind cutaway guard wall is irradiation unit. Note ray gun (right end) directing electron beams at food packages passing below on moving belt.

1.86 megarads became limp and showed a pronounced loss of the sharp acid flavor. After 4½ months' storage at 40F., rhubarb sauce irradiated at 930,000 rads in film pouches (polyethylene-coated Mylar), had an acceptable flavor. Color of the sauce progressively degraded as doses were increased from 142,000 to 930,000 rads.

Checks On the Vegetables

Asparagus: A slight preference was indicated for non-irradiated samples of asparagus as compared with those given 186,000, 465,000, and 930,000 rads. A loss of characteristic bouquet was noted at 930,000 rads, and the product was softened and bleached. At lower doses it was termed "flat".

Refrigerated shelf-life of hermetically sealed blanched asparagus was more than tripled by irradiation to 0.37 magarad. However, it has been observed that counts of aerobic and anaerobic bacteria continue to increase during storage.

Snap beans: Storage studies indicate that 93,000 rads yield a better bean than do doses of either 460,000 or 930,000. Blanched samples given up to 930,000 changed from green to dull olive, lost their characteristic flavor, and broke down physically within 5 weeks at 40F.

Lima beans: Refrigerated shelf-life of hermetically sealed blanched lima bean samples irradiated to 450,000 and 690,000 rads has been extended approximately four times. These storage tests are continuing.

Beets: This vegetable was cooked, peeled, sliced, and packaged in the poly-Mylar envelopes, then given 930,000 rads and stored with non-rayed samples at 40F. After 1 month, treated samples still had a fresh flavor. However, they had lost their bright pigmentation and turned a dark maroon.

Broccoli: Blanched for 2 min. and irradiated at 695,000 rads, broccoli was still considered good after 27 days. Non-rayed samples similarly blanched began to break down after 13 days of refrigerated storage. Rayed samples were described as having a bright color and a slightly flat taste, but no off-flavor, signs of mold, or other deterioration.

Brussels sprouts. This vegetable, when blanched in boiling water and subsequently irradiated at 698,000 and 930,000 rads, developed a strong acrid taste after 2 weeks in refrigerated storage.

Cabbage: Heads given 230,000 rads remained acceptable. But at 930,000 rads severe loss of texture was observed. Odor and flavor were unchanged up to 1.86 megarads. However, heads taking up to 2.79 megarads were organoleptically undesirable.

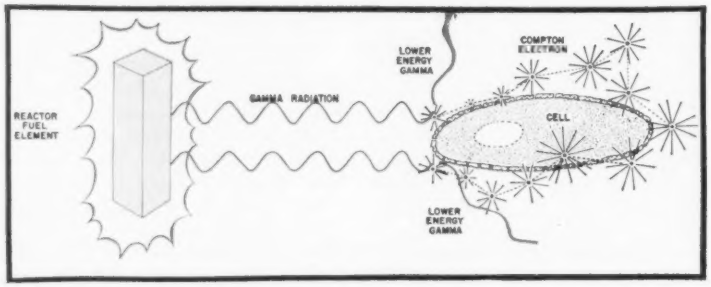
Relative to shredded cabbage, no color, texture, or flavor changes were noted in samples taking 47,000 and 140,000 rads. After irradiation, the packaged product (perforated cellophane or polyethylene bags) had prolonged refrigerated shelf-life—up to 25 days, as compared with 6-7 days for unrayed controls.

Carrots: Undesirable sensory characteristics were produced by 465,000 rads, but were removed by cooking. This dosage, however, was generally insufficient to protect against microbial spoilage in 70F. storage.

Cauliflower: The threshold dose, short of producing off-flavors in blanched cauliflower, was found to be considerably below 100,000 rads. As this is below levels necessary to control microorganisms, no further work was performed.

Celery: Here, flavor and texture were lost under doses to 230,000 rads. Some of flavor returned after storage at 36-40F. for 1 week.

Corn: Blanched corn proved sensitive to irradiation, with off-flavors at doses of less than 1 megarad.



MECHANISM OF IONIZING RADIATION: Created by treatment (gamma rays depicted) is an environment incompatible with the cell's continued function. Relatively few rays act directly on cell itself.

Cucumbers: Loss of texture and offensive odors when given more than 930,000 rads.

Endive: No flavor change noted when treated with 46,000 rads, although a non-rayed control sample was preferred. Rayed endive remained satisfactory after 19 days, whereas the control had spoiled.

Lettuce: No marked irradiation odor or flavor were noted at 930,000 rads. But poor quality was observed due to loss of crispness and natural flavor. It's interesting that a slight, but statistically significant, firming of lettuce appeared at 43,000 and 340,000 rads, with softening not starting until about 600,000 rads.

Peas: At 744,000 rads there was a softening effect on blanched green peas. This was equivalent to boiling peas an additional 4 min. after blanching. Using a blanch with sodium ascorbate, peas receiving 1.4 magarads were acceptable after 45 days at 38F.

Spinach: Blanched spinach given up to 930,000 rads remained good after 12 days' storage at 40F., but was in poor condition after 18 days. Unblanched spinach was adversely affected even at 93,000 rads.

Squash: Although no particular color or textural changes were noted at 465,000 rads, the organoleptic threshold dosage was reported to lie between 140,000 and 195,000 rads.

Tomatoes: With firm, ripe tomatoes, inoculated with *Alternaria tenuis*, 279,000 rads delayed rot for 10 to 11 days at 70 to 75F. In comparison non-rayed controls showed initial rot after 3 days.

Under 279,000 rads, rotting was proportionately faster. At 46,000 rads there was no appreciable difference between treated tomatoes and controls. At 465,000 rads or above, no rot was evident over 16 days.

Injuries such as softening of tissue and bleaching of skin were noted at progressively higher dosages (over 465,000 rads). Some studies indicate that irradiation of green or pink tomatoes produces erratic ripening behavior.

Acknowledgment: The author expresses appreciation to the following individuals and organizations for information that aided in the preparation of the above article: L. Beraha, USDA, Beltsville, Md.; A. L. Brody, Whirlpool Corp., St. Joseph, Mich.; L. E. Brownell, U. of Michigan, Ann Arbor; Z. I. Kertesz, Cornell U., Geneva, N. Y.; W. C. Kuhn, Marshburn, Inc., Norwalk, Calif.; G. MacKinney, U. of Calif., Berkeley; R. T. Milner, U. of Illinois, Urbana; S. M. Orsi, Kraft Foods Co., Chicago; L. H. Pollard, Utah State U., Logan; B. E. Proctor, MIT, Cambridge, Mass.; and R. I. Wagner, Anaheim Cold Storage, Inc., Fullerton, Calif.

QM Action on Flexible Wraps, Instant Bread

For packages, foil laminations are favored. And web-form fabrication is one concept. For loaf mix, "principle" is seen established . . . But problems postpone perfection in both spheres

WHAT STRIDES has QM made with flexible packages for heat-processed foods? . . . And what are chances for a field soldier's instant bread mix?

These were two salient questions spotlighted by Quartermaster Food & Container Institute experts at the recent annual meeting of the Command's Research & Development Associates.

FLEXIBLE PACKAGES (W. S. McGregor): There was early recognition of high suitability of flexible ration wraps. Stimulation for new effort has been the advent of the polyesters, such as Mylar and other high-temperature resistant stock.

Trials have since indicated that only laminates containing foil show real promise, with 3-ply design preferable. In short, no single film was found satisfactory for the series of foods tested.

Generally, an inside layer of vinyl has served well for the pertinent temperature ranges (180-250F), while providing desired sealing qualities. Low-density polyethylene handles non-greasy foods below the boiling point. And using aluminum foil as the center ply gives moisture resistance and gas transmission. Finally, strength is supplied by an outer ply —employing certain polyester materials, and in some cases cellulose acetate.

As for heat-processing the flexible package, it's been found that essentially exhausting the air before sealing (no large headspace) makes conventional steam processing feasible as long as pressure cooling is carefully controlled.

Dried beef, sliced peaches, steaks, and applesauce have shown satisfactory results.

The carton enclosing the ration is ingeniously designed to set up as a stove, employing the double-boiler principle. Here, water put in the base serves three purposes: Removes heat from paperboard, preventing it from catching fire; transmits this heat (in form of steam) to package; and finally can be used for coffee, etc.

It's emphasized that many problems must be resolved before flexible packaging can be introduced in military supply lines.

Indications are that bacteria can penetrate these flexibles even where foil is included. This calls for further efforts to find safeguards.

One processing concept envisions a continuous operation in which packages are fabricated in web form and never separated until completely processed and cooled.

INSTANT BREAD MIX (S. A. Matz): Status of loaves baked in metal containers or in flexible packages is of prior concern to the question of an instant field bread.

Can-baking protects against spoilage, but the container adds about 50% to the weight. And while sealed flexibles can serve the same function as cans, the danger of crushing is introduced.

As for quality, the fresh-baked product stands supreme, and though progress has been made to narrow the gap, QM doesn't expect to have a completely stable white bread in cans or flexibles within the foreseeable future.

Accordingly, there has been consideration of dehydrated bread. Here, experiments indicate that the texture-staling reaction can be overcome (a favorable point compared with canned or film-packaged loaves). However, dehydrated bread is extremely fragile. Also, no suitable way is known to properly rehydrate it.

In view of the varied difficulties, attention centered on the possibility of an instant bread mix for field use. A mix employing chemical leavening combined with dry flavors offered the best approach. Sodium bicarbonate was decided on for the gas source.

Selection of an acid component for the leavening system gave trouble. Finally selected as meeting the complex requirements was the del talactone of gluconic acid—which performed quite well under varying conditions and yielded finished-bread end-products that were tasteless, or nearly so.

Using this acid plus the bicarbonate, techniques were developed giving a product very closely resembling a normal loaf of good quality yeast-leavened bread. The judgment was: Texture, good; internal appearance, satisfactory; taste, fair. True, appetizing aroma of the fresh product was missing. However, stability of flavored mixes made with the dehydrated flour was good.

Since fermentation in the dough can't be used as a source of flavor in the instant bread, it was necessary to add these substances in more or less "active" form to the dry mix. Two approaches were possible: Either use synthetic flavors or employ natural flavors from fermentation systems. The "natural" has proved the more successful.

It was found that simple broths containing yeast, sugar, and buffering agent gave results indistinguishable from more complex broths of flour, milk solids, fats, salt, or combinations.

Lyophilized broth can easily be added to the dry bread mix to make a complete product requiring only water to be ready for mixing. Laboratory mixes already give bread rating higher in acceptability than superior examples of canned bread. But the loaves are only fairly resistant to storage deterioration. At 100F., the acceptability drops rapidly.

A start has been made toward designing specialized continuous mixer-and-extruder equipment (development contract to Food Machinery & Chemical Corp.). Here, progress is reported on a machine to extrude 2-lb. piece of dough made from instant bread mix.

Overall, the workable field bakery handling the instant mix remains promising—but will take years to perfect. The present instant mix merely establishes the principle. It is not the final answer to the problem of the small field facility. —*End*

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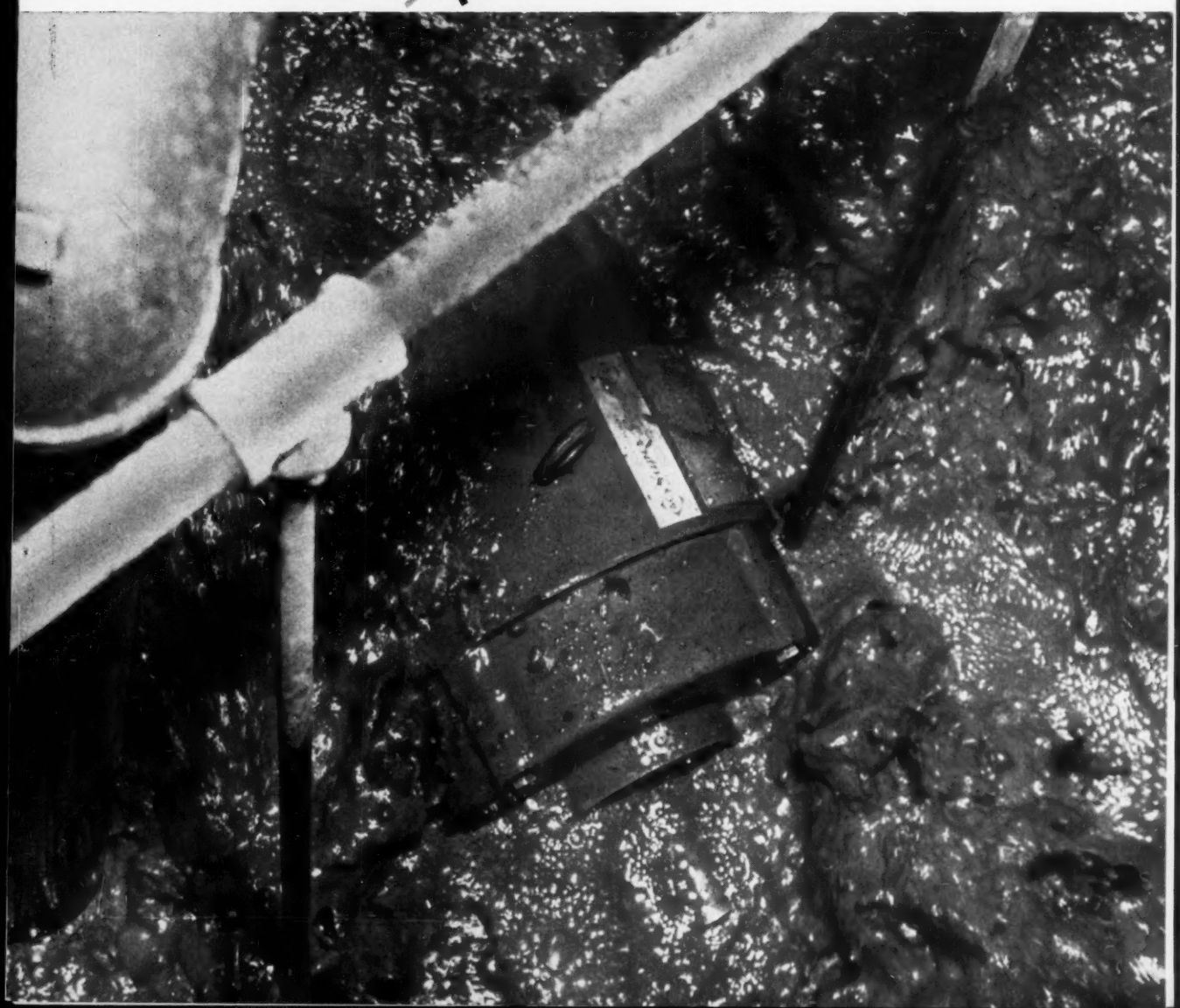
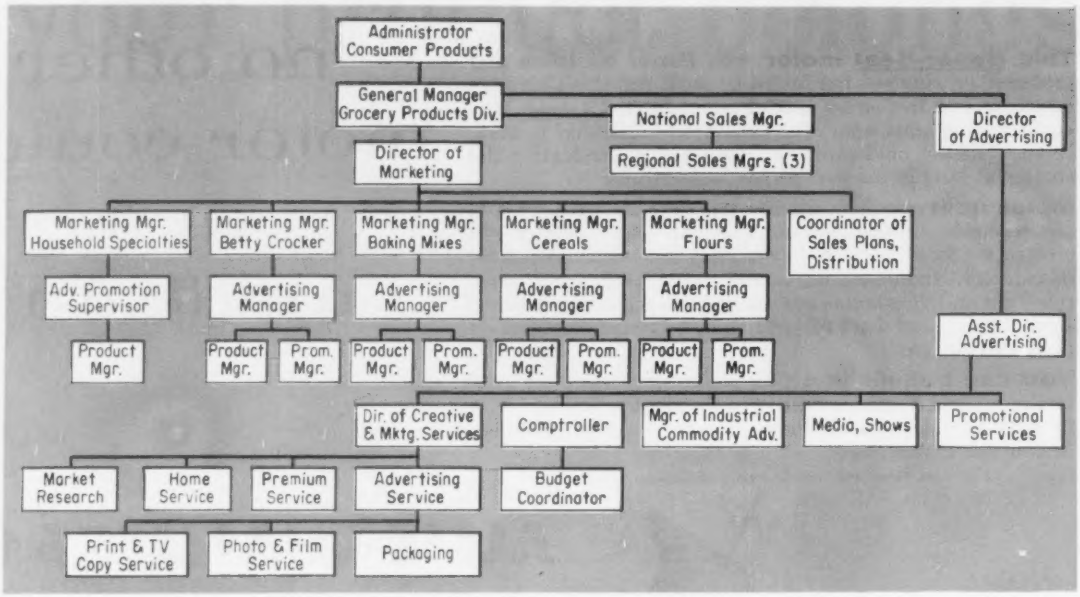




HEAD MAN in GM's new food marketing program is gen. mgr. of grocery products div. Reporting to him are marketing director and national sales mgr. Set up effectively gears day-to-day actions with long-range objectives.

GM's Decentralized Setup Teams

Five product marketing groups, with in-depth support, develop and coordinate consumer-trade programs. Then, sales force concentrates on activating strategies . . . Result: Speedier attainment of volume goals

TEAMWORK isn't just a "pep word" in General Mills' updated market planning. It's the key function.

Here, plan-ahead objectives are coordinated with day-to-day merchandising, completely and flexibly. And for most effective integration of the two, GM shrewdly gears manpower so that the 'planners' and 'doers' are free to devote full energies to what they're best suited for.

The factors behind this shift to specialization are the same as those which affect all food marketers today. GM's A. Z. Kouri, v.-p. and administrator of consumer activities, puts the points succinctly: "Prime directives of our Grocery Products Div. are: (1) Work for greater profits through currently marketed, as well as newly developed, products; and (2) plan and build for future growth and opportunities.

Sharper Focusing

"To keep pace with food industry expansion and increasing complexity, we reorganized and expanded our marketing department. Now, marketing, advertising, and sales personnel reach their objectives more directly and make decisions with greater certainty."

Basically, the organization changes were designed to: (1) Utilize product-category marketing teams that specialize in developing, formulating, and coordinating consumer-trade programs. (2) Permit sales personnel to concentrate on day-to-day execution of marketing programs so as to attain the budgeted volume.

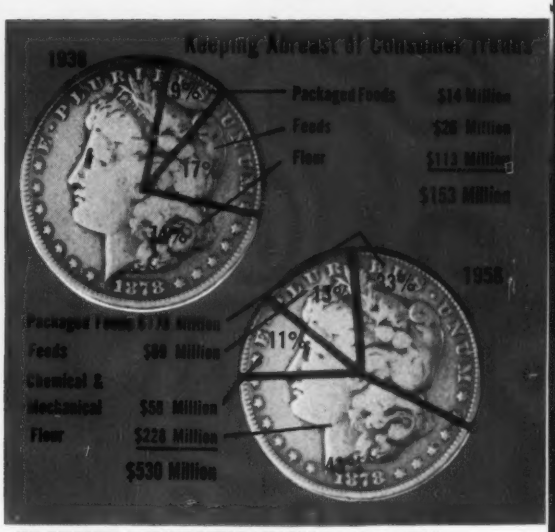
The Outcome

This way, responsibilities are more effectively pinpointed. Separate marketing specialists handle each of the five groups of products, and salesmen devote full time to selling. So there's no duplication of work or responsibilities.

Streamlining the marketing department says GPD's General Manager J. P. McFarland, has paid off in these ten ways:

- **Protects and augments company's consumer franchises.**
- **Delegates product and budget responsibilities of advertising, sales, and promotion.**
- **Coordinates advertising activities of all related areas within company.**
- **Provides, as required, specialized advertising, marketing, and promotion services.**
- **Offers greater flexibility, inasmuch as operations don't become too complex because of expansion. Additional marketing groups, for instance, can be put on when needed—no boosting of the workload of others.**
- **Carries out current and long-range marketing plans for growth and expansion.**

MARKET PLANNERS huddle with A. Z. Kouri, v.-p. and administrator of consumer food activities. Participating are (left to right) J. M. Coleman, national sales mgr.; J. P. McFarland, v.-p. and gen. mgr. of grocery products div.; E. H. Andreson, v.-p. and director of marketing for GPD; Mr. Kouri; J. S. Fish, v.-p. and director of advertising; and C. S. Samuelson, asst. director of advertising.



PRODUCT DIVERSIFICATION has kept GM in tune with changing consumer patterns. Firm's packaged food sales have shot up 1,150% since '38, while overall volume gained 246%. By moving emphasis away from flour products, company has profited from 'convenience' foods boom.

'Planners' and 'Doers'

▶ Prevents bottlenecking of decisions, since each marketing group analyzes its own product problems and taps all available company services and resources to do a better job.
▶ Directs and coordinates combined buying power of company for best selection of promotion media.
▶ Accomplishes more with advertising agencies, and coordinates joint activities of several agencies.
▶ Backs up sales department by putting into its hands such necessary tools as pricing, promotional material, and the right packages. The sales department, as a result, can set, and reach, goals better.

In all this, flexibility is a most important feature. For example, when GM entered refrigerated foods, a separate staff worked on these products as part of its normal activities.

Creating New Department

Reporting directly to the general manager of the GPD is the director of marketing. His staff is made up of five marketing managers and a coordinator of sales plans and distribution.

Each manager is assigned to a product group—as flours, cereals, baking mixes, Betty Crocker mixes, or household specialties. Working directly under each manager is a team comprising advertising, promotion, and product managers.

The five marketing groups can produce results faster and with less personnel. The reason: Specialization and strong top management support guarantees prompt help from all departments.

General organization and operating procedures of the marketing program are defined in writing. But GM deliberately avoids spelling out every step in excessive detail. That's so the marketing team will have considerable latitude for initiative and imagination.

The new department is freed of all in-the-field sales responsibilities. These functions, now comprising a separate phase of the marketing program, are under a national sales manager, who reports to the GPD general manager. Aiding the sales manager are three assistants who keep tabs on what is going on throughout the country.

The present marketing setup was shaped gradually over three years. True, GM previously had sales, advertising, and promotional departments, but responsibilities were delegated differently.

Two steps preceded the switchover. First, consolidation of promotion with advertising. Second, separation of sales from marketing.

Today, the sales department is no longer directly charged with pricings and profit-and-loss responsibilities outside of its own bailiwick. Once marketing decisions are made, the department initiates the necessary action.

Mounting the Attack

The marketing plan is devised "to live" with the growth and expansion of the food field—the largest single industry in the U. S. For this reason, each marketing team has someone with mature sales experience, knowledge of technical phases of advertising, and high promotional aptitude—all to supplement advertising plans with sales activities to produce the maximum results at the point of sale.

In action, marketing first seeks out its problems, decides where and

SUPERMARKET DISPLAY is checked by (left to right) A. Z. Kouri; Kermit Paulsen, district sales mgr; J. M. Coleman; and Truman LaBonte, account supervisor.

how to attack them, works up solutions, and then dispatches the draft of proposed strategies to the sales department for execution. As a result, the latter isn't tied down by thinking-ahead activities that aren't its responsibilities.

GM's experience is that this approach not only piles up sales dollars, but also produces a "never-stop-looking-for-improvements" chain reaction.

Advertising and promotional targets are better centered as a result of the new setup. Ad managers within each product-market group work hand-in-glove on a day-to-day basis with advertising agencies to avail themselves of their concepts and capabilities. Their job is to select, budget, and coordinate the various types of advertising.

Assisting them are product managers, who handle a specific item or a group of products. They, too, are in daily contact with ad agencies, selecting and evaluating plans and programs.

Each promotion manager working on a product group is sales-oriented. He's an expert on selling advertising at the point-of-sale (grocery) level.

Follow-through on a project within any of the five market-product groups entails an extensive evaluation procedure. All sources of information are explored to throw light on product, package, production costs, advertising investment, market testing (if new product), etc.

Dissemination of information is a two-way street. Marketing passes on what it has to sales and advertising. And the latter two departments shuffle what they have back to marketing.

Others Backing Attack

Supplementing activities of the five marketing groups are advertising service (which includes packaging), marketing research, premium service, and home service (Betty Crocker Kitchen). Ranged under the wing of the director of creative and marketing services, who reports directly to the director of advertising, these operations contribute as follows:

. . . **Advertising service:** It acts in an advisory capacity, evaluating agency media presentations. It also serves as a creative liaison between marketing and advertising agencies, getting layouts or TV story boards (sketched-out actions prior to filming) cleaned through legal, home service, and other necessary departments.

Upon clearance, material is relayed to product and advertising managers. And when it's finally Okayed (with the advertising manager shouldering the responsibility), advertising service shoots it back to the agency.

This group also handles point-of-sale materials, and film production.

Its packaging activities follow the same clearance route, except that here advertising service works with a package design consultant and assumes GM packaging responsibilities.

Packaging people also call upon the services of other company facilities, such as the photography department (for pictures of package designs), and the supervisor of package production, who works with material suppliers and engineers to get the best possible reproductions.

. . . **Home service:** In test kitchens, it works out recipe variations. And it goes on to finalize all company-product recipes as required for use on packages and sacks, in publications and TV commercials, in store-tie-in pieces, etc.

It has its own testing facilities for consumer corroboration or rejection of recipes. And it is an important source.

. . . **Marketing research:** This section market-tests new and established products, along with package changes, via jobbed-out questionnaires. And it coordinates all activities farmed out to market research firms.

. . . **Premium services:** This group selects and develops some of the premiums used in conjunction with GM's products. And it cooperates, in this respect, with ad agencies.

Premiums, the company feels, are essentially action stimulators. But their motivating purposes may vary. They may be employed to create initial purchase action in the introduction of a new product, or used as a counter-activator against strong competitive consumer inducements. They may also be presented to resample an established product.

Through the right selection, premiums may be used to facilitate a new use for an established item. Or they can provide a continuous bonus to help crystalize occasional purchases into more habitual ones.

In all instances, when properly used, they essentially act as stimulants in the basic selling programs.

Top merchandising promotions, in the nature of tying in sales efforts and consumer advertising with retailers' activities, are enabling GM to do a still better job of selling its products.

Grocery-products promotions focus attention on a specific idea or program to stimulate extra profits for company and retailers. Frequently inspiring the activities are tributes paid such promotions by the grocers.

—FE Staff

For free reprint of this article, write K-2 on Reader Service Card, back of issue

Now from Du Pont Research comes a new kind of paint that definitely *retards the spread of flame.*

Rigorous testing by Underwriters' Laboratories has proved conclusively that Du Pont Fire Retardant Paint helps answer the plea of firemen to "Find a way to give us a 5-minute jump on most fires and we can control them."

Du Pont Fire Retardant Paint is a durable, washable interior flat finish that *looks, applies and wears like regular flat wall paint.* It can be brushed, rolled or sprayed . . . comes in seven eye-pleasing colors: Sunlight Yellow, Pale Blue, Daylight Green, Light Green, Pale Pink, Guards Gray, Ivory—and White.

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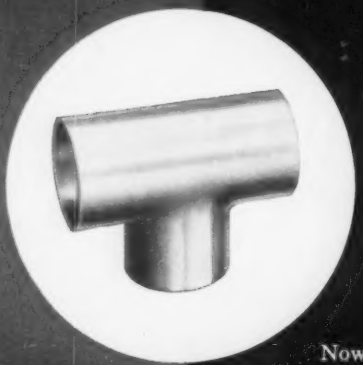

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Now, from Tri-Clover Division—leader in the field of sanitary fitting design and manufacture—comes the all-new "TRI-WELD" concept of butt weld stainless steel fittings, specifically designed to meet the demand for a *quality* line of stainless steel fittings and valves for permanent "CIP" installations.

Built in 1½", 2", 2½", 3" and 4" O.D. tube sizes, "TRI-WELD" fittings offer the kind of streamline design and flush joint assembly that assures full, unrestricted flow of liquids . . . the kind of quality fittings you have learned to expect from Tri-Clover for almost 40 years.

To make easier, more accurate installation *right on the job*, Tri-Clover is also offering a new portable welding unit designed to meet field requirements for simple, fast welding of "TRI-WELD" fittings and valves.

See your TRI-CLOVER DISTRIBUTOR or write for new Catalog W-159.

TRI-CLOVER

LADISH CO.

Tri-Clover Division
Kenosha Wisconsin

IN CANADA: Brantford, Ontario

EXPORT DEPT.: 8 South Michigan Ave., Chicago 3, U.S.A.

S-1058

In-Store Displays That Work . . .

. . . give added persuasiveness to your consumer-wooing . . . Here are tips on how to get the most out of point-of-sale promotions

COOPERATIVE ADVERTISING at point-of-purchase is the best insurance for your national ad dollar. For, it produces the big payoff inside the store.

So emphasized Val S. Bauman, v.-p., National Tea Co., at the recent convention of the Point-of-Purchase Advertising Institute.

Bauman stresses that requests for off-location display — store islands, end-of-aisles, and front window spots —should be accompanied by a spectacular promotion or special sales event. The tie-in is important, he says, because extra display space must be continuously allocated by the retailer, whose store generally carries 10 to 15 such displays. An average store can't, in a year, feature more than 10% of the 5,000 items it sells.

Retailer's interest in special displays is guided by the kind and volume of p-o-p material provided, according to Bauman. Store operators will be more pepped up if the display does a good 'related' job promoting other items. He looks for spectacular displays that support the manufacturer's products and add in-store excitement and interest.

Bauman also stresses the importance of increasing sales through sampling—provided it doesn't interfere with store traffic. For special events like store openings, National has sample-demonstrated 2 to 3 thousand 10¢ meals that are made up of as many as five products.

Most important sales presentations are made to National's sales executives, with sales manager relaying them to the merchandising committee and, from there, to the field organization. At the same time, direct mail instructions go to each store manager.

Key It to Retailer

Bauman suggests that manufacturers manipulate advertising-merchandising programs so that they're flexible enough to fit into the retailers plans. That is, design the p-o-p advertising with retailer in mind so as to help him sell more.

H. T. Webb, president, Red & White chain, states that the secret of supermarket merchandising lies in the power of in-store promotions to move tremendous volumes. Special set-ups sell about 5½ times more than conventional shelf-displays, he adds.

Webb also feels that the manufacturer who has a complete store-wide selling that pivots around his product has a better chance of having his ad plans accepted than the supplier who relies on small cards or shelf strips.

A. J. Maleske, Libby, McNeill & Libby, points to the importance of promotions both inside and outside the store. His company takes advantage of outside-the-store displays built around windows, fronts, parking lot walls, sidewalk sandwich boards, even airplane pilots for dropping handbills, and Indians posed outside shopping centers. Truckload outdoor sales—giving easy transfer of goods from tail gate to customer's car—also have been successful.

Traffic stoppers inside the store should have a touch of the ingenious, advises Maleske. Examples: Putting dollar bills on a money tree, using floor fan in warm weather to attract shopper to cool spot, and posing salesmen as live scarecrows or clowns.

A Q&A discussion turned up several points for better planning:

Q—How large should spectacular displays be?

A—Size should be tailored to store area. National Tea's bigger units take a kit with 100 pieces, and smaller ones a kit of 50 pieces. The extra large stores can use 4 or 5 kits.

Q—Who decides on the amount of material used in a display?

A—Knowing size of stores in a designated area, the retailing company can tell the food firm's district sales rep the amount that's needed. Bauman says a store may use 500 to 750 displays in a year.

Q—Where consumer prices are lower for an item on display, who pays the difference?

A—The retailer usually absorbs the cost. Often, lead items are incentive-priced to move large volume.

Q—How long do spectaculars remain in a store?

A—Usually 1 week, sometimes 2 or longer. Depends on sales.

Q—Isn't there some waste of display material?

A—True, there's waste. But there's less of it if time and attention is devoted to the planning stage.

Q—Are display bins effective?

A—Bauman thinks they are. National even employs shopping carts (casters removed) as effective bins.

Q—How many of manufacturer's salesmen should be used when cooperating with stores in a p-o-p promotion?

A—Bauman didn't give a specific figure, but pointed out that the manufacturer can get a good idea, through discussion with chain headquarters personnel, of the number needed for assisting stores in arranging displays and following through on the job. —*FE Staff*

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For more data, circle 276 on Reader Service Card

CASE HISTORY OF MONTH

From files of *National Consumer Panel Division of Market Research Corp. of America.* Material is factually correct. Identities of products and companies have been masked to insure anonymity.—The Editors

Pinpoints Cause of Sales Drop

Management's problem

WE ARE COMPETING against two major national brands, a number of "price" brands, and a chain's very strong private label. Competition is intense, marked by heavy use of advertising, promotions, and deals.

Lately, it's become apparent that our sales are gradually slipping. It's clear that we must determine the reason—or reasons—for this declining trend, so that effective counter action can be started.

WHAT WOULD YOU DO?

Management's decision

We ordered a special analysis of the purchase records of families in the National Consumer Panel to get the answers to these four specific questions:

1. Are we obtaining an adequate number of new buyers? 2. Are we getting the right kind of new buyers? 3. Are we converting new buyers into steady customers? 4. Are we retaining our customers?

To gather the data, researchers isolated all the families that had bought any brand in our product category between July and December of 1957. Then the purchases of these same families were checked for the same period in 1958. Also, data on new buyers for each brand were obtained for the latter period.

Result of action

The study revealed that our customers were buying the product in approximately the same *quantity* as customers of the other national brands. Moreover, figures on repeat purchases showed we were holding our customers to the same extent as the competing brands. This eliminated the possible reason for our decline.

However, one major difficulty revealed was that we were not attracting new buyers at the same rate as our competitors. This deficiency was further compounded by the fact that our new buyers were below-average users of the product.

Also significant was the fact that our 1957 customers who failed to buy our brand in 1958 did not switch to price brands. Instead, they turned to other major advertised brands. This indicated that our losses were not a price problem, but rather an inability to compete on equal terms with other leading brands.

NCP records showed that the heaviest buyers of our product category were chain-store shopping younger families with children. But our brand franchise was deficient in such families. Moreover, the trend was unfavorable.

This analysis gave us the basis for reorienting our marketing efforts. We geared our advertising to reach heavier users of the product, stressed appeals to younger families, and increased in-store efforts where heavy users shop.

For more information, write to Case-History Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y. Your inquiry will be directed to the source of the case-history item.

New Low Cost Chlorinated Water Supply FOR FOOD PROCESSING PLANTS

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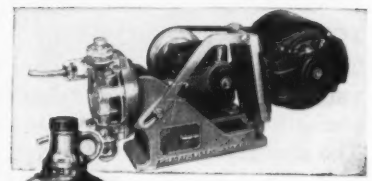

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Circle 277 on Reader Service Card

Aluminum Foil Packaging -Vacuum Packaging

Report No. 20 of a Series by Reynolds Metals Co.

Of all methods of flexible packaging, only the vacuum pack approaches the ultimate in the protection it provides. Used for foods and other products subject to deterioration and spoilage, vacuum packaging in its complete form provides by far the greatest protection against moisture loss or gain, oxidation, chemical change or decomposition and bacterial changes. It assures to the consumer higher quality maintained over a shelf life many times longer than is possible with products not vacuum packaged.

To achieve its high potential, vacuum packaging must have perfection in the material used. The material must be impermeable to water vapor, oxygen and gas permeability. It must maintain this impermeability under varied conditions—high and low temperatures, high and low relative humidities. In flexible packaging, these extreme specifications can be met only with aluminum foil as a component of the material used. And aluminum foil also provides impermeability in another useful sense. It is completely opaque—excluding light rays that can cause losses of vitamins, nutrients, flavor and color.

Various Foil Materials

Aluminum foil vacuum packaging materials include laminations to such heat-sealing films as Saran, Vinyls, Pliofilm and Polyethylene. Extra strength or use characteristics can be provided by adding Mylar,* cellulose acetate film, cellophane, paper or fabrics. Other vacuum packaging materials can be made by extrusion coating of aluminum foil.

With these many combinations of materials, various processes can be used. After the evacuation, essential for the removal of all oxygen, it is sometimes advisable to add nitrogen or other inert gas at atmospheric pressure. Also, the possibility of sterilization methods in processing and packaging is to be considered where straight vacuum packaging is not sufficient to prevent bacteria or mold growth—as in packaging meats and other foods high in moisture content. Many other foods can be vacuum packaged indefinitely if they are dry or dehydrated or if they contain a sufficient concentration of salt or other preservative.

Again, the length of storage life depends upon the moisture, gas and oxygen permeability of the package. Laboratory tests have shown that powdered whole milk, coffee, dehydrated meats and vegetables will keep more than two years without loss of quality when vacuum packaged in aluminum foil laminated pouches.

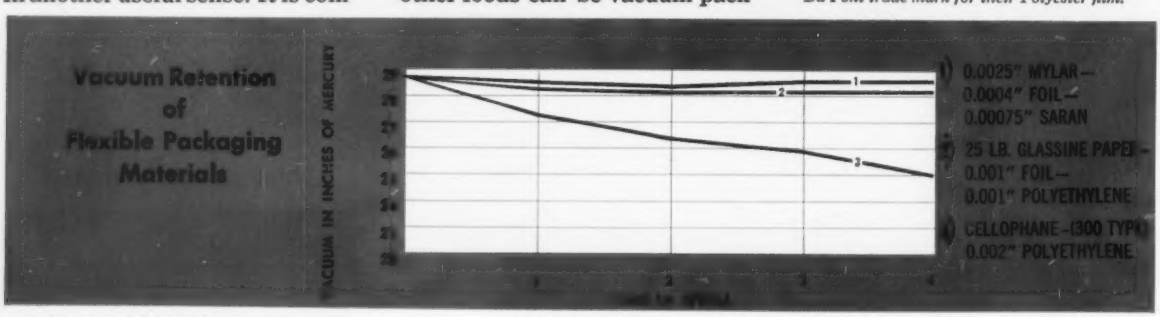
Explanation of Chart

The graph shows typical permeability or vacuum retention properties of three materials used as pouches for vacuum packaging of sliced luncheon meat. All were packed at a vacuum of 29 inches of mercury. Loss of vacuum was measured weekly for four weeks. Note that the pouches with aluminum foil, materials 1 and 2, maintained a vacuum of over 28 inches throughout the four-week test, while the non-foil material lost nearly 4 inches of vacuum. In the same study, the meat in the foil vacuum package, when stored at 40° F., was normal in color, odor and appearance after 40 days, whereas the meat in the non-foil package stored under the same conditions retained its normal color, odor and appearance for only 20 days.

An additional advantage of flexible vacuum packaging over other forms is the saving obtained in weight and in space.

For more information, call any Reynolds sales office or write to **Reynolds Metals Company,** Richmond 18, Virginia.

**Du Pont trade mark for their Polyester film.*



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Watch Reynolds TV show "Walt Disney Presents" Friday nights on the ABC-TV Network.

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You name it...

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. . . because with Stange, seasoning is both a science and an art: Science —in processing the basic seasonings: Art—in the application of these seasonings to your products to achieve distinction in their field for flavor and eye-appeal.

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Printed in U. S. A.

Merger Pot Boils Over

Creeping concentration in food distribution has inspired a lot of talk but little action. However, two important developments last month indicated that this verbal phase may now be a thing of the past.

A documented study by National Assn. of Retail Grocers shows that, since '55, 68 firms gobbled up 2,657 stores whose annual sales volume of $2.9 billion was equivalent to grocery store sales in 14 states.

Among implications this trend holds for food manufacturers, says Nargus, are: Reduced bargaining power since there are fewer buyers purchasing a greater share of the output; loss of regional outlets for smaller suppliers; more competition from distributor brands that are backed by stronger retailers; and stepped-up pressure for preferential treatment by the bigger distributors.

Soon after the report was released, FTC slapped 3rd-ranking Kroger and 5th-ranking National Tea with anti-trust charges. Replying, National's Pres. H. V. McNamara said his firm's $794 million volume in '58 was only 1.75% of the nation's total food store volume, and that sales of the chain's own manufacturing operation in Chicago came to 1.4% of National's total business.

Mail Marketing Goes Selective

A computer system that selects consumer markets by name and address according to pre-arranged socio-economic factors has been introduced by O. E. McIntyre Inc., third largest mail order firm in the country. Built around a Univac II that works with magnetic tape, the system selects from a file of 36 million families those most likely to buy a certain product.

Executive V. P. Randall P. McIntyre says the system enables marketers to tailor mail couponing and sampling programs to the most productive customers.

Faster Communications at Less Cost

New teletype network recently opened up by General Foods is designed to speed the flow of messages between 38 GF locations in 31 cities. Furthermore, adds Pres. Charles G. Mortimer, the network "will contribute to improved customer service and to important savings in communications cost."

GF says its messages will have a smaller unit cost than regular telegrams, adds that big savings will be in converting long distance phone calls.

A similar setup employed at Nabisco has helped that company to chop $1,000 a month off its phone and telegraph billings.

Brighter Prospects in Puerto Rico

Associated Foods' modern wholesaling center, set up six months ago in Puerto Rico, is already improving the island's distribution system, reports Harold Unterberg, executive secretary.

He told an American Management Assn. seminar that the one-stop depot, which houses over 2,500 items, has helped to reduce store operation costs by enabling retailers to (1) get more orders from fewer middlemen; (2) introduce better standards of quality control (Item: AF was first concern in P.R. to use refrigerated trucks for handling perishables); and (3) stabilize prices, since retailers are now able to work with smaller inventories.

The island, which annually imports $160 million of food products from U. S., will also benefit from a new flour-feed mill just opened there by Nebraska Consolidated Mills.

Dairy Group Spotlights 3 Markets

National Dairy Council's educational efforts this year will be slanted to three specific age groups—the 16 million teen-agers, 65 million business and industrial employees, and the 61 million "senior citizens."

Surveys show that per capita milk consumption among these groups is far below dietary needs. Bringing consumption up to recommended dietary levels would open up a potential of 33% more milk than is now being sold, says Pres. Milton Hult.

BRIEFS

A 24% increase in private label sales in '58 was reported by Topco Associates, buying agency for 29 chains.

Pickup in beer sales, which began last Fall, has continued through March. Anheuser-Busch says its barrelage was up 15% in first '59 quarter.

Higher unit volume of aerosol foods is sparked by introduction of more syrups, spreads, and toppings. Jumping from 85 million, total may go to 95-100 million this year, says Canco's Robert Hollister.

Approach of outdoor cooking season enhances tie-in promotions between relish makers and manufacturers of other food products.

$4 million bonanza for housewives: Birds Eye's 30th anniversary promotion will see 80 million 5¢ coupons inserted in newspaper advertisements.

"Footballing" of broilers at store level has prompted National Broiler Council to begin series of meetings with top retail organizations in an effort to smooth out the roller coaster prices.

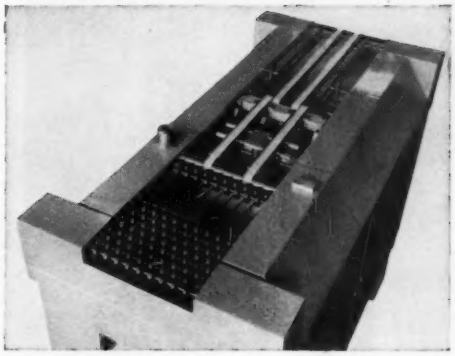
One-week seminar on decision-making process in advertising and marketing will be sponsored by Advertising Federation of America at Harvard Business School, July 5-11.

Another 'Canned Foods Month'? Canners League of Calif., guiding spirit in last Fall's venture, now feels followup should be decided by National Canners Assn.

Stronger product image targeted: Nehi has changed its name to Royal Crown Cola for closer tie with product that accounts for about ⅔ of company's volume.

Printed in U. S. A.

fmc sets the pace in high speed electronic check weighing



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With a constant speed, no-stop motion, this new check weigher takes the production from one or more filling lines via high speed conveyor, weighs and segregates each package according to preset tolerances for over or under weight. Fully automatic, it operates without an attendant.

The new FMC Electronic Check Weigher handles round, conical, rectangular, oblong or irregular packages up to 10" wide by 10" long. Package weight ranges from 1 ounce to 1 pound or from 8 ounces to 3 pounds. Controls for setting weight tolerances are simple and readily accessible on a side panel. Recording instruments and numerical counters are supplied if required.

Extremely compact, the unit is only 48" long by 24" wide. The height is adjustable from 30" to 42" to fit into any existing production line.

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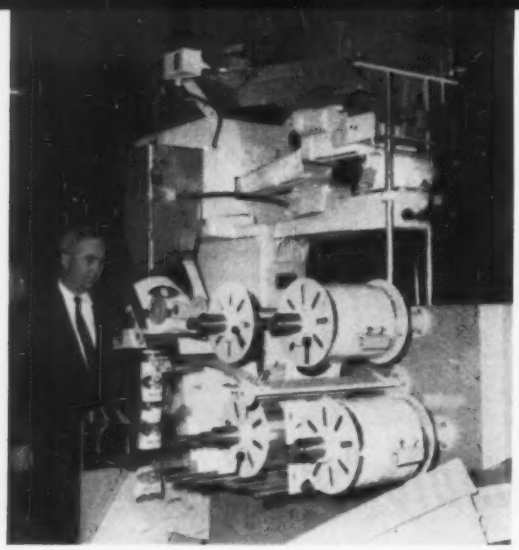
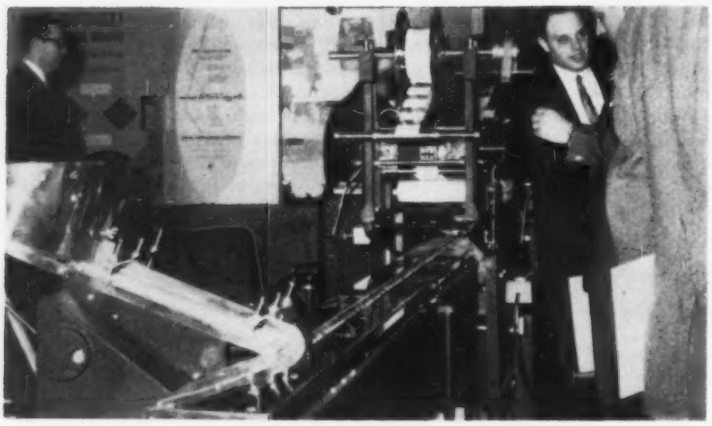


Panorama of New

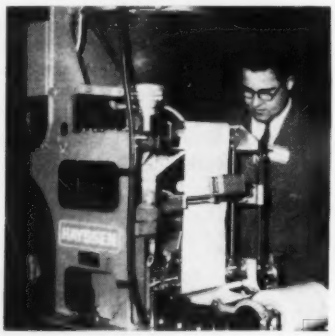
machines that save labor, material, and changeover time—up speed, too—high-light array of latest equipment at AMA's National Exposition

5 Formers, Wrappers

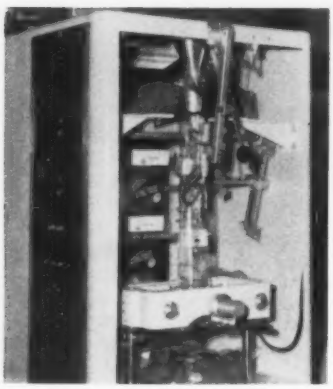
ELECTRONIC weight detector on pouch former-filler assures greater accuracy in handling fragile items. No adjustments for changing bag lengths, minimum for widths. Speed: 50 per min.—*Wright Mach'y Co., Durham, N. C.* (48)



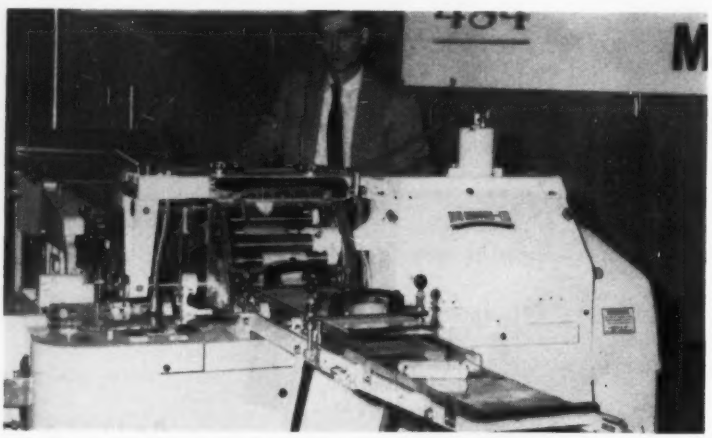
CONTINUOUS MOTION machine packages single or multiple units at speeds to 400 per min. Models offered to glue, heat, crimp or fold seal most papers and plastic films.—*Hudson-Sharp Machine Co., Green Bay, Wis.* (49)



COMPACT pouch former operates at speeds to 150 per min. Uses rotary instead of reciprocating motion with dwell time and pressure. Available with scale, volumetric, auger and liquid-pump feeds.—*Hayssen Mfg. Co., Sheboygan, Wis.* (50)

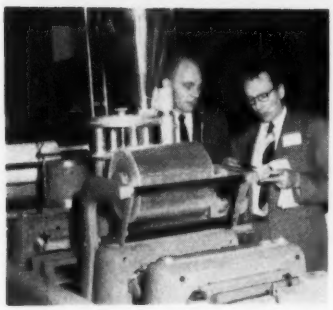


AUTOMATIC PACKAGER designed for speedy changeover for different size or weight packages. Equipped for volumetric or net weight fillling. "No product, no bag" feature.—*General Packaging Equip. Co., Houston, Tex.* (51)



ROLL WRAPPER orients hopper-fed confection tablets for end feeding to sorting-collating lanes. Tablets single- or double-wrapped with folded or twisted ends, pre-cut or roll-fed application of labels. Feeder handles wrapped or unwrapped items, segregates colored or flavored ones.—*W. H. Kansteiner & Co., Chicago* (52)

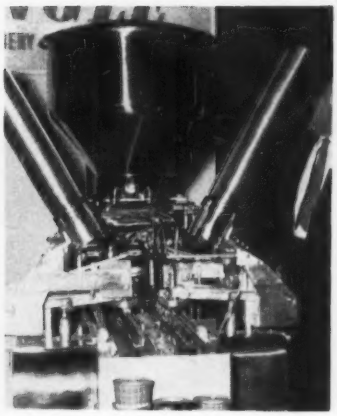
Packaging Units



SYNCHRONIZED UNIT heats roll-fed thermoplastic film, forms into single or multiple containers, fills, seals and trims cover from roll-fed sheet specially designed for mass-packaging.—*Conapac Corp., N. Y. C.* (53)

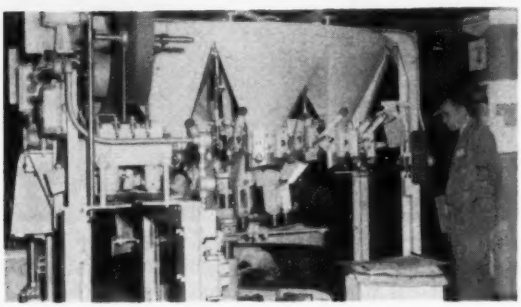
3 Fillers

PACKER picks up magazine-fed cups for delivery to 8-pocket filler, lid-applier and accumulator that collates 24 cups for automatic insertion into cases at 120-per-min.—*American Can Co., Easton, Pa.* (54)



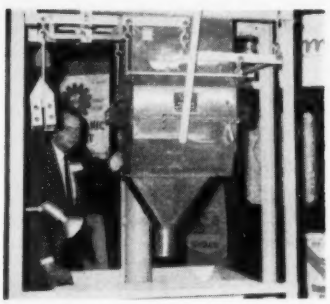
TWIN-LINE UNIT codes, fills, caps up to 120 cups sour cream or cottage cheese per min. Stainless fingers, synchronized with chain drive, prevent cup from sliding—*Triangle Package Mach'y. Co., Chicago.* (55)

5 Baggers

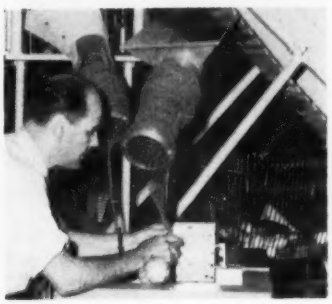


10-STATION rotating turret bag packer receives weighed product from multiple. scale. Variable speed drive permits handling up to 25 large bags per min.—*Bagpak Div., International Paper Co., N. Y. C.* (56)

BAGGER feeds two equal portions of tea onto reel-fed filter paper that's formed into double compartment by gusset-bottom fold, top-stapled. Thread, fixed to pre-cut tag, is attached to bag that's pushed into side-crimped envelope. speed: 150 bags per min.—*Teepack, Dusseldorf-Buderich, Germany* (57)



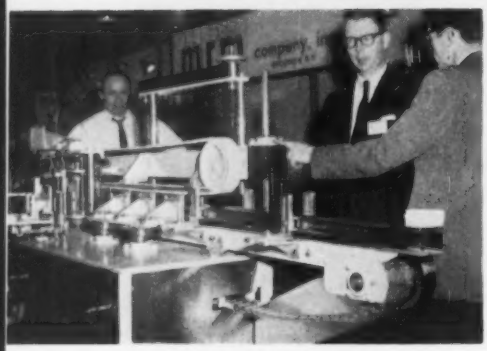
PACKER for multiwall bags features 3-compartment rotary hopper suspended from even-balance scale. Requires no outside power. Cycles at rate of 45 bags (100-lb.) per min.—*Raymond Bag Corp., Middletown, O.* (58)



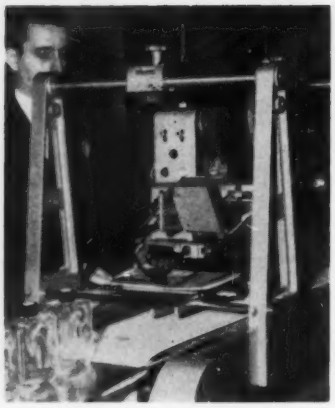
2-HEAD PACKER conveys produce to net weighers for tube-delivery into individual mesh bags. Chute-net system designed to handle up to 700 bags per hour. — *David S. Greenfield, N. Y. C.* (59)

BAG CLOSER heat seals inner plies, pastes and folds stepped end lip, applies gummed-taped seal to form water-, air- and moisture-vapor-tight containers at 10-per-min. speed.—*Union Bag-Camp Paper Corp., N. Y. C.* (60)

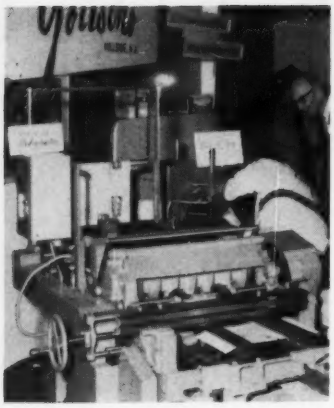
2 Labelers, 1 Coder



CONTINUOUS LABELER uses glue instead of vacuum-label pick-up. Foam rubber belt guides bottles to 3-station pressure applicators. — *MRM Co., Brooklyn, N. Y.* (61)

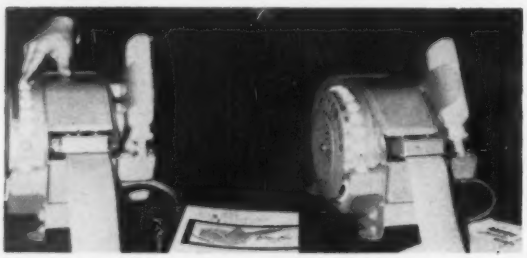


DISPENSER registers and applies pressure-sensitive labels to bottle caps or wrapped products at up to 150 per min. — *Derby Sealers, Inc., Derby, Conn.* (62)

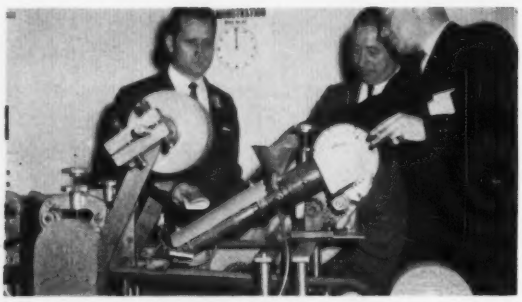


FRICTION-ACTUATED line unit imprints film as part of wrapping operation. Employs quick-drying inks of any color. — *Adolph Gottscho, Inc., Hillside, N. J.* (63)

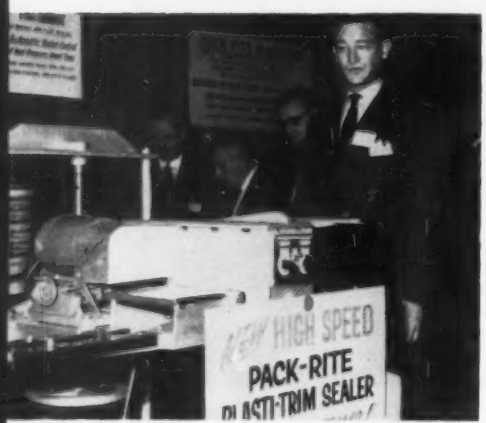
5 Sealers



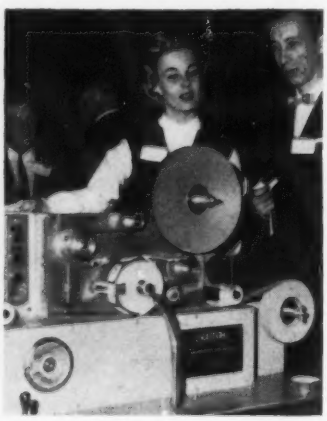
SEALER selects tape length at feather touch, thermo-moistens (for deep glue penetration), delivers and cuts ready for use.—*Better Packages, Inc., Shelton, Conn.* (64)



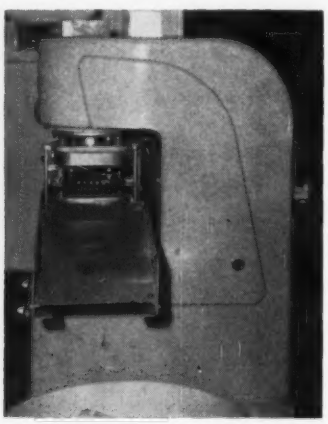
HOT MELT EXTRUDER simplifies handling by applying continuous line glue to various combinations of paper and film.—*National Starch Products, Inc., N. Y. C.* (65)



AUTOMATIC UNIT seals polyethylene bags, trims portion above seal line. Rolls thermostatically controlled. Has own fluid oiling system.—*Pack-Rite Machines, Milwaukee.* (66)



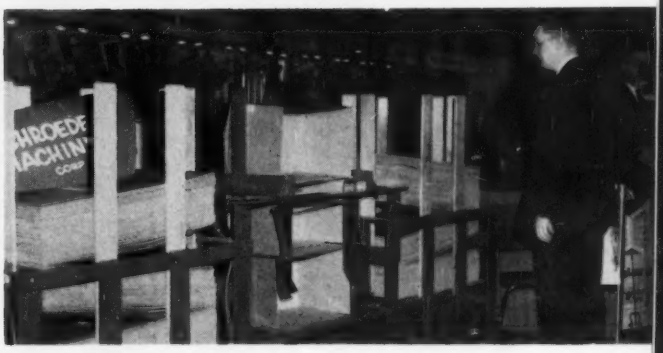
SEALER heats and pressure fuses biaxially oriented polystyrene lid and container flange without aid of solvents or adhesives at 40-per-min.—*Anderson Tool Co., Ludlow, Mass.* (67)



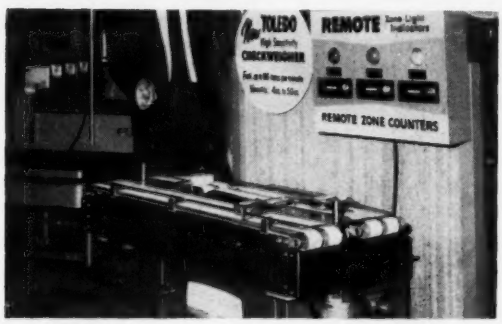
VACUUM WHEEL APPLICATOR picks up and cuts rollfed pressure-sensitive labels at rate of 2,500 per min. —*Minnesota Mining & Manufacturing Co., St. Paul, Minn.* (68)

3 Casers, 2 Checkweighers

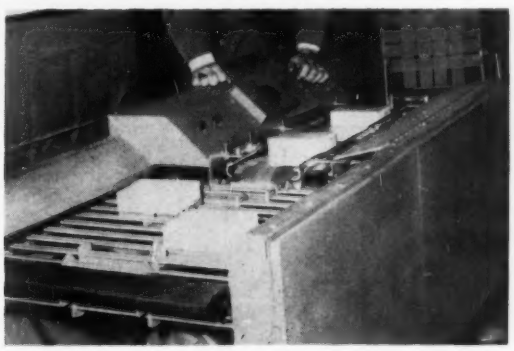
PNEUMATIC packer loads shipping cases at 16 per min. Delivers cartons to loading head without turning, twisting or up-ending.—*Emhart Mfg. Co., Portland, Conn.* (69)



OPEN-FORMER is pneumatically driven. Selects flat case from magazine, applies glue, opens, forms, folds bottom flaps and seals.—*Schroeder Machines, Syracuse, N. Y.* (70)



ELECTRONIC check weighers, for 4-50 oz packages and for 50 to 200-lb. bags or cartons. Weight zones can be visually indicated by panel-mounted lights or counters. Electronic components housed in dust-tight cabinet.—*Toledo Scale, Toledo, O.* (71)



ACCURATE (1/30-oz), high-speed (275 per min.) check weightr features positive, gentle 3-way package segregation. Requires no change-over for packages up to 5¼x6x6 in.—*Illumitronic Engineering, Sunnyvale, Calif.* (72)

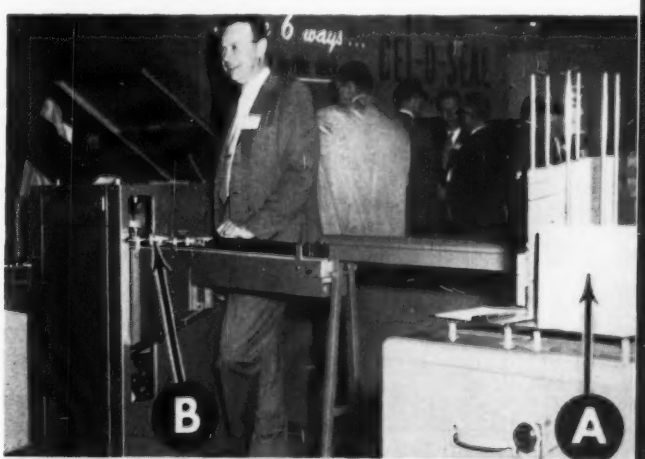
3 More New Units For Greater Efficiency

SENSING CONVEYOR eliminates line pressure on accumulated cases. Chain-operated, limit-switch controlled lift transfers cases from one conveyor level to another in same or opposite direction.—*Rapid-Standard, Grand Rapids, Mich.* (74)

PERMANENT magnetic rails and pulleys convey and elevate cans safely. Unit saves space, requires minimum maintenance, conveys up to 90 deg. incline.—*Eriez Mfg., Erie, Pa.* (75)

PLASTIC BLISTER package line comprises pressure package-former, die cutter to slit material in formed sheet-size units, and 6-tray (9 compartment) turn-table sealer. Handles all thermoplastics.—*Tronomatic Mfg., N. Y. C.* (76)

Circle key numbers on Reader Service Card, back of book

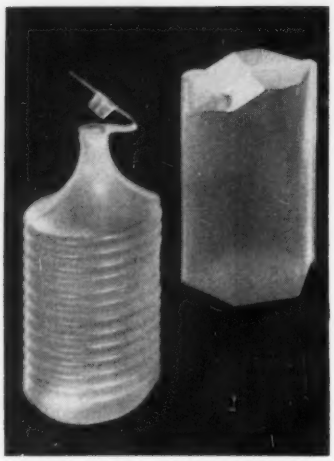


CARTONING LINE consists of opener (A), closer (B) operating at 60 per min. Magazine-fed containers set up prior to filling and top-flap closing.—*N. J. Machine Corp., Hoboken, N. J.* (73)

Films Also in Focus (Turn Page)→

BLISTER PACKAGES, popular with household items, seem set for bigger food play through use of new automatic handling machinery. Collamer Produce says packs have eliminated 90% of waste from spoilage, enhanced product appearance, helped sales increase 33%. (77)

"PIGGY-BACK" PACK combines "go-together" foods. Here, bottom half is string-opening paper-body biscuit dough container, while top half is a can that snaps into recessed metal end of paper container. By Canco (80)



ODD-SHAPED PVC CONTAINERS, fabricated from roll sheet at packaging point, bring big inventory savings. Seals are made by high-frequency welding. Leedpak machine does forming. (81)

FOIL-LAMINATED corrugated box, which keeps beverages cool 6-8 hr., will be tried out this summer by Haffenreffer Brewing and Charles E. Hires. Unit doubles as picnic cooler, was developed by Alcoa and Stone Container. (78)

RIGID PLASTIC BOX, made from flats of high density polyethylene or cellulose acetate butyrate, can be formed in plant. Product of Metal Edge Industries, container can be made into various shapes. (79)

Pay-Off Packages & Wraps

—that caught eyes at AMA show . . . Plus-values are built in

DO-MORE containers and films that bring bigger returns on the packaging dollar caught the interest of food marketers at last month's American Management Assn. Exposition in Chicago. Here are the leading highlights:

Expandable foamed polystyrene shipper (Koppers), being tested by Howard Johnson restaurant chain for ice cream, makes use of plastic's inherent insulating ability to protect product for longer periods of time with less dry ice than is required by conventional containers. Completely waterproof, unit is lighter than cork, and can be molded to any desired shape. (82)

Durable 600-gage polymer-coated cellophane (Du Pont) gives candy and cookie bags greater rigidity, hence avoids "shopworn" look through repeated in-store handlings. Price: 85¢/lb.; yields 10,300 sq.in./lb. Brach is using the new film for some of its confections. (83)

Aluminum foil vacuum container (Reynolds), for luncheon meats and dairy items, conforms to product shape, saves on shipping weight and space. Greaseproof, package is suitable for cook-in use. (84)

Non-fogging perforated Pliofilm (Goodyear), for produce, works equally well with sleeve, band, or overwrap applications. Price: $1.30/lb.; yield: 33,000 sq.in./lb.. Available in ¾-mil rolled stock, film permits individual cut-to-size packages, heat seals on portable machine, reduces inventory found with pre-cut sheets. (85)

Molded PVC (polyvinyl chloride) trays (Pantasote), which caught on with candy, cookies, and fruits, is now being modified for meat and poultry use. Trick here is to develop cover that can either be heat-sealed, or locked, to tray body. (86)

High density polyethylene bag (W. R. Grace) gets first commercial use as container for frozen cheesecake, put up by Columbia Ice Cream. The 2-mil unit reportedly has three times the moisture protection of conventional poly. (87) —*FE Staff*

UNMATCHED for

• SAFE • EASY • ECONOMICAL

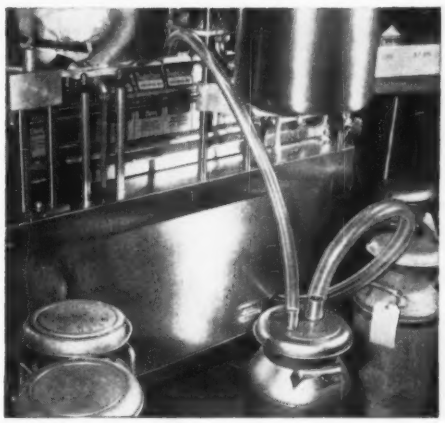
Piping of Liquid Foods and Beverages

Combining the non-contaminating properties of stainless steel . . . the flexibility of rubber . . . the clearness of glass . . . and the toughness of leather, Tygon plastic Tubing, Formulation B44-3, has no peer in food handling applications.

Completely odorless, tasteless and non-toxic, Tygon B44-3 is safe for use with even the most flavor-sensitive foods and beverages.* With a surface smoothness far greater than that of either rubber or stainless steel, Tygon will not trap minute food particles which foster bacterial growth. Tygon can be quickly cleaned, is unaffected by all common cleaning agents, and can be sterilized with steam (open-end flushing) or bactericides.

Available in over 65 standard sizes up to 4" I.D., flexible Tygon can be used with a wide range of fittings, can be put into service quickly and inexpensively.

**For processed milk and milk products, use Formulation B44-4*



Compare the unique advantages of Tygon B44-3 with any other piping medium and you'll see why more and more bottlers and food processors are standardizing on Tygon. Write for your free copy of informative Bulletin T-97 . . . today!

OUR 100th YEAR

Plastics and Synthetics Division

U. S. STONEWARE

AKRON 9, OHIO

Tygon is a registered Trade-Mark of The U. S. Stoneware Co.

416-F

NEW FROM ROCHE

WATER-DISPERSIBLE DRY BETA CAROTENE BEADLETS (TYPE 2.4-S)

On addition WATER-DISPERSIBLE

after 10 seconds WATER-DISPERSIBLE

after 45 seconds WATER-DISPERSIBLE

BETTER Selling Looking Colored LIQUID FOODS

with New *DRY* Safe

Beta Carotene Beadlets

(Type 2.4-S, Water-Dispersible)

1. ***Better, because . . . Water-Dispersible, Fast*** — Roche Dry Beta Carotene Beadlets (Type 2.4-S) are almost instantly dispersible in water and fruit juices (see illustration). A clouded effect similar to that produced by fruit insolubles is contributed. The bland-tasting beadlets have good stability.

2. ***Better, because . . . Edible, Free-Flowing Beadlets*** — Tiny droplets of beta carotene are enclosed in dry, edible, free-flowing, water-dispersible Beadlets. They standardize the color of such foods as:

- Fruit juices
- Fruit drinks
- Juice concentrates
- Mellorine
- Baked goods
- Cheese
- Eggnog
- Gelatin desserts
- Dessert toppings
- Puddings
- Confections
- Egg yolk products
- Creamed foods
- Soups
- Other foods having a water base

3. ***Better, because . . . Absolutely Safe*** — Beta carotene Roche is the pure, man-made "duplicate" of the product which nature has widely distributed in the vegetable foods we human beings have been eating for thousands of years.

4. ***Better, because . . . Colors Easily Standardized*** — Color is easily standardized from yellow to orange depending on the amount of the Beadlets used.

5. ***Better, because . . . Vitamin-A-Potent*** — Each gram of the Type 2.4-S Beadlets provides approximately 40,000 U.S.P. units of vitamin A activity.

6. ***Better, because . . . Mesh Sizes Varied*** — The Roche beadlet particles represent a combination of commercial 30 to 80 mesh material.

OTHER FORMS OF ROCHE BETA CAROTENE PRODUCTS IN VEGETABLE OIL

Widely popular for use in certain oil-base foods, these are: 30% Beta Carotene Liquid Suspension • 24% Beta Carotene Semi-Solid Suspension • Blends of Beta Carotene and Vitamin A • Blends of Beta Carotene to specified dilutions.

Ask your Roche salesman or write to the Vitamin Division for free samples.

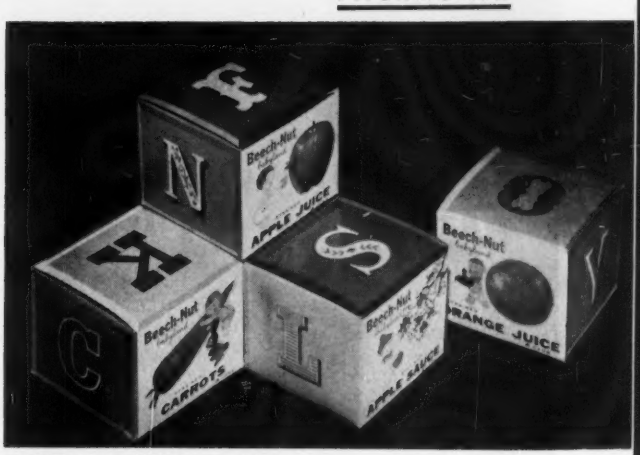
VITAMINS COME *RIGHT* FROM ROCHE

VITAMIN DIVISION • **HOFFMANN-LA ROCHE INC.** • Nutley 10, N. J.

Pacific Coast distributor: L. H. Butcher Co., San Francisco • Los Angeles • Seattle • Salt Lake City Portland. *In Canada:* Hoffmann-La Roche Ltd., 1956 Bourdon Street, St. Laurent, Montreal 9, P. Q.

7 Food Boxes Take 10 Awards

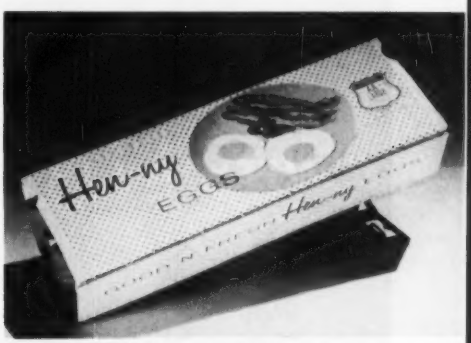
Annual competition of Folding Paper Box Assn. of America saw these food packages sweep highest honors in key classifications—potential volume use, merchandising superiority, printing superiority.



DOUBLE WINNER is alphabet-block package of Beech Nut-Life Savers, Inc. Used to merchandise canned baby foods, vari-design carton rated a first award for potential new volume use in foods, and a merit award for merchandising.

PRODUCT VISIBILITY and re-use possibilities earned this cookie carton a first award for potential new volume use in bakery goods. George A. Krug Baking Co., New York City, is the cookie packager.

DISPLAY PLUS PROTECTION was formula that gained two honors for Brown & Haley carton. It won first award for potential new volume use in confections and a merit award for merchandising superiority.



PICTORIAL EGG CARTON is bright new approach to packaging a basic product. Continental Produce Co. uses this 4-color carton. It took merchandising superiority honors in food division.

FROZEN PASTRY packaging of Pepperidge Farms was another double winner. To it went first award for general merchandising effectiveness, plus honors for printing superiority.

GIFT PACKAGE of champagne, introduced by Great Western Producers, was another front-liner. It was victor for general merchandising in beverages classification.

CARRIER DIVISION winner was Pfeiffer Brewing Co.'s 6-pack "take-home" for 12-oz. cans. It was judged tops in competition's general merchandising category.

THE ONLY LUG CAP . . .

deep sides give added strength; choice of plain or knurled sides; flat-seating threads for sure seal

WITH A LIVE RUBBER SEAL . . .

best withstands live steam; won't stick to glass; easy to apply; stays put; vacuum-seals

AND ONLY CROWN MAKES IT!

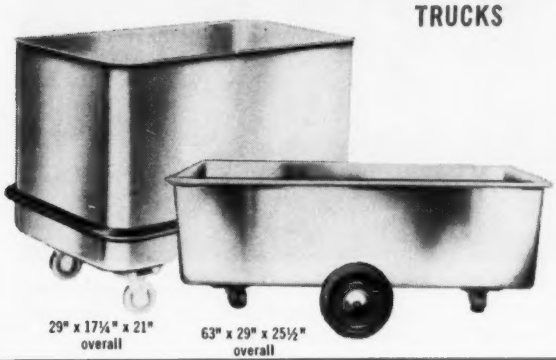
for cans · closures · crowns · machinery **CROWN**

CROWN CORK & SEAL COMPANY, INC., 9300 Ashton Road, Philadelphia 36, Pa.

cut handling and storage costs...

WEAR·EVER ALUMINUM

TRUCKS



29" x 17¼" x 21" overall

63" x 29" x 25½" overall

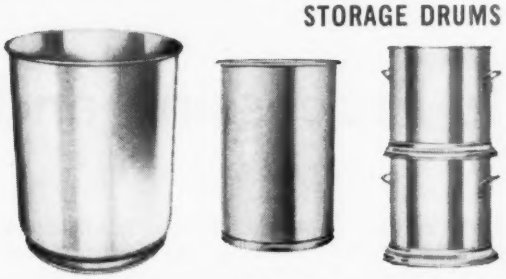
MOBILE BINS

38 gallons

30 gallons

27 gallons

STORAGE DRUMS



50 gallons

30 gallons

4, 6, 9 and 14 gallons

TRANSPORT BOXES

34 3/16" x 16⅛" x 12"

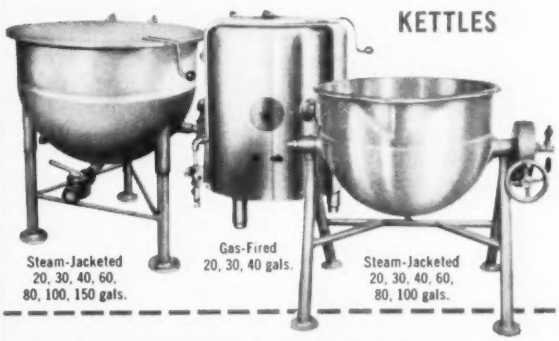
22½" x 20½" x 6½"

UTILITY ITEMS

10, 12, 14, 16 qts.

2 qts.

KETTLES



Steam-Jacketed 20, 30, 40, 60, 80, 100, 150 gals.

Gas-Fired 20, 30, 40 gals.

Steam-Jacketed 20, 30, 40, 60, 80, 100 gals.

Now you can speed production, and simplify your handling or storage problems with standard, readily available Wear-Ever plant service items like these.

Wear-Ever's complete line of handling, storage and service equipment is constructed from specially developed, tough, hard-wrought aluminum alloys to assure longer life.

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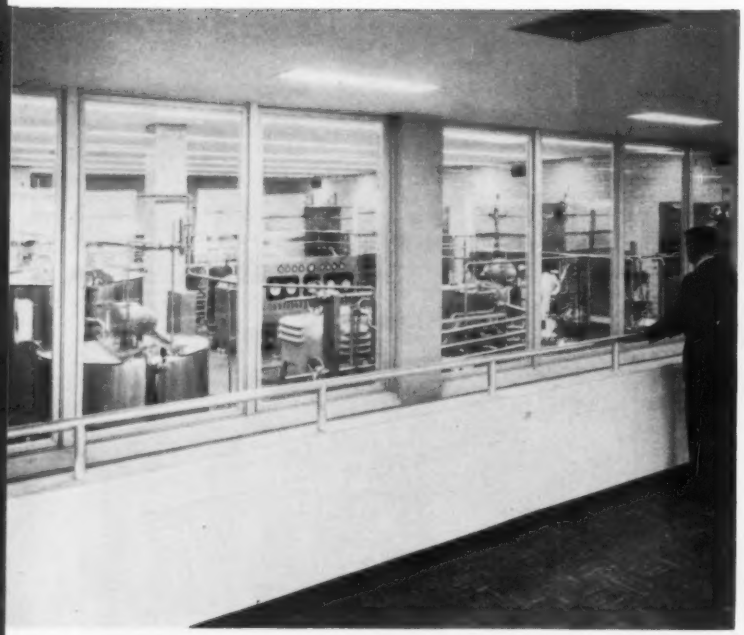
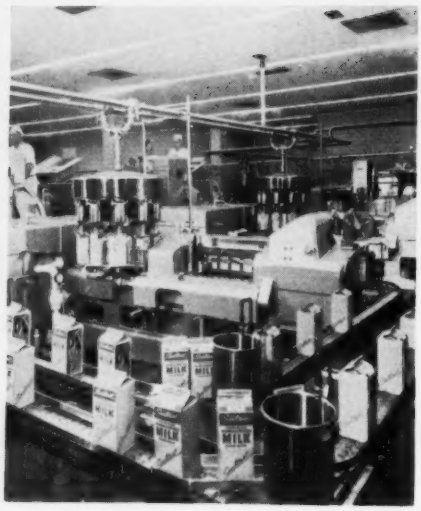


STRIKING SEALTEST LAYOUT prevues new-decade operation. Galleries give visitors close look, with PA and tapes detailing action. Seen here is second floor processing room.



TILED BOTTLING ROOM has paper forming-and-filling machines for ½-gal., qt., and smaller-size containers.

'Showcase Plant' Is Processing and

PRIME EXAMPLE of the modern trend in dairy-plant design and construction is the recently completed "Showcase Plant" of the National Dairy Sealtest Foods Div. in Pittsburgh.

In it are incorporated such labor-saving advances as automatic casing, case stacking, floor conveying, and "stack-slide" case handling. And processing is carried out on the 2nd floor, permitting gravity flow to the 1st floor filling room.

There are several notable differences between this large facility and many other recently constructed milk-processing plants:

▶ Immediately apparent is the absence of space-consuming stacks of cases containing returned bottles waiting to be washed and filled, and the conventional bottle-washing and filling equipment.

Instead, the fully tiled filling room contains six paper-bottle forming and filling machines—2 for quarts, 2 for ½-gals., and 2 for smaller size cartons. And ample space remains for installation of several more units when needed.

ARTHUR V. GEMMILL
Senior Associate Editor, "Food Engineering"

▶ Special observation galleries (first photo) enable visitors to view the various operations without entering the processing areas.

Each corridor is equipped with a public address system that permits the guides to describe operations to large groups either by means of a microphone or a tape recording.

These galleries were especially constructed for convenience of guests. During plant tours, they can fully observe various processing steps with a minimum of noise and maximum safety.

It Wasn't Planned for Paper

At the time the new facility was being planned to replace company's old plant in downtown Pittsburgh, executives anticipated continuation of the split operation (glass and paper).

However, an unexpected development—ruling by the Pennsylvania Department of Agriculture permitting sale of ½-gal. containers of milk at a lower price per quart than for single quarts—caused company executives to quickly re-evaluate the situation.

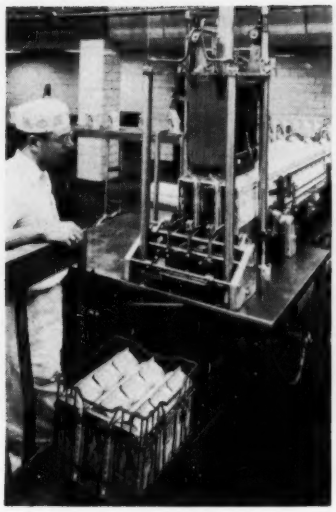
In order to distribute milk in 2-qt. glass bottles, it would have been necessary to install new bottle washing and filling equipment in the old plant, then move them to the new one as soon as it was completed.

Also, approximately 99% of the company's wholesale business was already in paper containers. And consumer acceptance of this type package in the Pittsburgh area seemed to indicate a steady shift that would probably result in the complete elimination of glass within five years.

So, when customers began to demand delivery of milk in 2-qt. quantities, the decision was made to switch to paper for all retail routes. A 2-qt. paper unit was added to the paper equipment already in the old plant and glass filling units were removed.

And although there were numerous problems in converting the large (252-route) operation, the difficulties were almost completely ironed out by the time processing was transferred to the new facility.

As a result the company is now enjoying certain benefits, most important of which are: (1) Improved sanitation; (2) savings in storage space; (3) increased volume per



FILLED CONTAINERS are automatically assembled and deposited in new type space-saving wire cases.

RETAIL TRUCK LOADS are assembled along sides of cold room according to previously prepared load sheets.

WHOLESALE TRUCKS and transports are loaded directly from floor conveyor in center of platform.

Handling Model

Enterprising Pittsburgh dairy harnesses advanced practices for top performance. Highlight is astute switch in line with state ruling

route; (4) reduction in injuries to employees; and (5) elimination of claims from customers.

In design of the new plant, Sealtest engineers gave top priority to materials handling. For example, the filled containers are conveyed directly to automatic packers that transfer them to specially designed wire cases. These cases are only ⅔ the size of conventional wood or metal ones, thus save valuable space in the cold room and truck bodies.

Filled cases are conveyed to automatic stackers, which pile them 5-high. The stackers are set in an alcove between filling and cold rooms so they can discharge directly onto the floor conveyor that runs the length of the cold room. Conveyor then continues 310 ft. along the wholesale truck and transport loading platform.

Retail drivers prepare their load sheets 48 hr. ahead of time. From these, the box men make up loads by removing stacks of various products from the floor conveyor and assembling them at specific stations along the side walls.

Company's wholesale trucks and transport trailers are equipped with individual refrigeration units that operate from electric outlets installed in sides of the loading platform. These carriers are loaded directly from the floor conveyor by transferring stacks of cases into the truck bodies.

Sanitation Accented

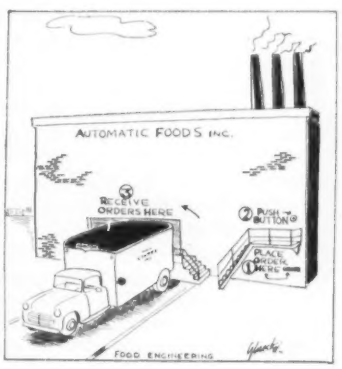
In addition to making the conventional provisions for sanitary operation– such as tiled walls and floors of processing, filling, and receiving rooms, stainless equipment and piping, and cleaning-in-place–the engineers took advantage of a number of new developments. Here are a few:

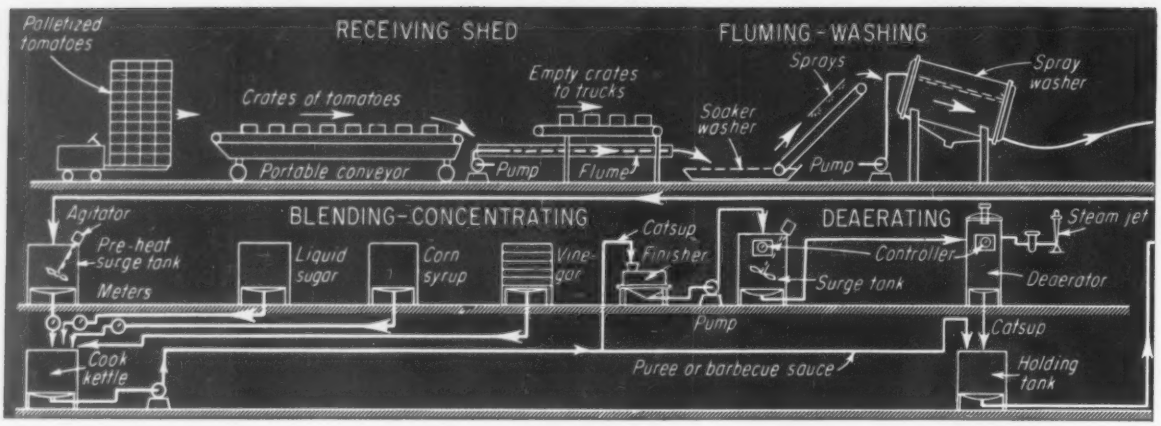
1. An improved washer that gives the previously mentioned wire cases a complete detergent wash followed by a cleansing water rinse. This results in a really clean case, something that was not easily attainable with the conventional solid cases and previously available washers.

2. Disposal of all excess paper by converting it to a virtually dry pulp. Employed here are two advanced units: (1) A small device that converts the emptied returned milk containers to a slurry (FE Aug. '58, p. 41), and (2) a large machine that shreds and slurries cartons and other scrap paper from all parts of the plant, mixes this with the aforementioned slurry, and presses out the water. This machine discharge a pulp that's easily trucked from plant.

3. All lighting fixtures in operating areas are flush mounted in the ceilings. As an additional safety measure, surfaces of these fixtures are covered with plastic.

4. Ice cream mix for sale to counter freezer operators and soft-serve stands is packaged in ½-gal. paper containers. This eliminates return of unsanitary cans. —*End*





How to 'Gear' for Boom Business

When rising sales demand a multiplied output, you can be in for a pack of operating problems. But with smart line methods—such as applied by Brooks—the "tough ones" can be tamed, with costs saved and Q.C. improved

IF YOUR SALES were to more than double in a decade, could you manage the multiple production problems?

▶ **Faced with such a challenge, Brooks Foods, Inc., Collinsville, Ill., tomato processor, has definitely come out on top. Its production hasn't got out of hand—instead it has grown more efficient year by year, while costs have stayed under control.**

Credited is application of top-flight techniques and gearing of the company's four plants and their personnel to the growing job.

To get these results, Brooks uses such productivity boosters as:

1. Close coordination between field and plant operations for steady flow of mature, top-quality tomatoes.

2. Inter-plant cooperation to increase overall efficiency. Seasonal plants at Converse and Lebanon, Ind., tank-truck puree to the Collinsville factory that operates the year around. And because this plant is not in production on tomatoes during the season, its bottling lines take some of the load from seasonal factories.

What's more, Collinsville, from which most of the sales originate, has more-than ample warehousing facilities. Notable savings are also achieved by eliminating costly hauling of some cased goods.

Bulk handling at Lebanon, for instance, merely involves gravity feeding puree from cook kettles into a 1,000-gal. holding tank. From here, it is pumped at 22 gpm. through a tubular-type, Freon-refrigerated heat-exchanger (chilling it to 60F.) and into tank trucks for a 300-mile haul.

3. Puree, catsup and chili-sauce stock is put up in 5-gal tins for use in non-seasonal plants to extend operations. Two types of containers are used—cans with roll-on seals (American Can) and screw cap (Continental). Filled cans are stacked 24 to a pallet for easy fork-truck handling. When empty, they are washed for re-use (2-3 seasons).

4. Bright can palletizing of No. 10's. System adopted 3 yr. ago at Lebanon plant saves approximately 4¢. per case. Cans are stacked seven layers high. Cardboard separates layers, and pressure-sensitive tape secures cans in top layer.

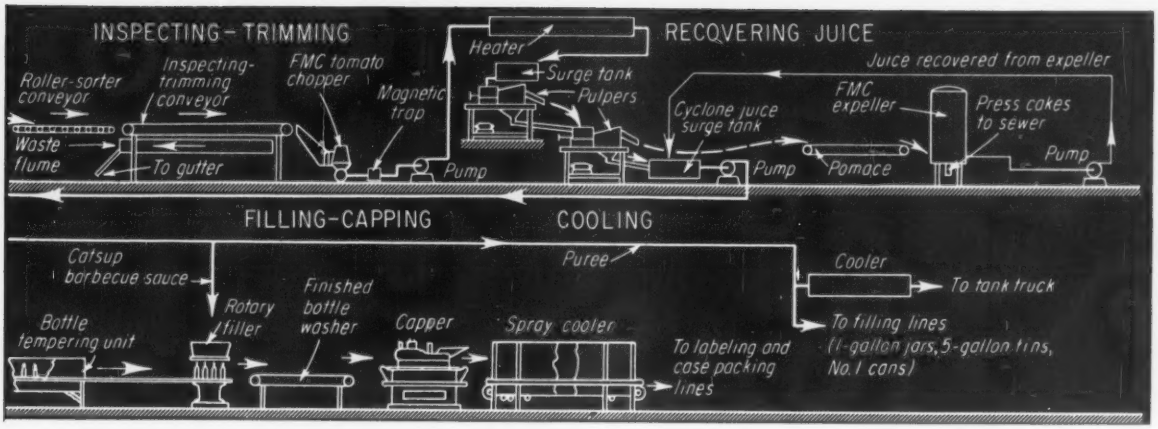
Specific benefits of the method: (1) Shipping cases aren't purchased until required, so there's no money tied up in them; (2) as needed during off-season, cans are labeled and cased by permanent employees; and (3) there's no chance of case damage, as when warehouse-stored to await shipment.

A multi-cart hauling system frees lift-trucks at the Mt. Summit plant for other handling duties. One tractor, hooked to five rubber-tired carts, transfers a "trainload" of empty glass containers about 1,000 ft., from warehouse to bottling line. Each cart holds a pallet load (49 cases) of empties.

Fork-truck pallet system handles tomatoes from grower to plants in James crates. A pallet holds 60 crates, each with 35 lb. of fruit. Empty crates are loaded on pallets for fork-truck transfer to outbound trucks. Method abolishes manual unloading of former 32-lb. hampers, plus their stacking and re-handling. It also speeds the receiving operation.

Separating the sorting and trimming operations speeds flow through inspection lines. Here, girls check tomatoes coming from roller-sorter conveyor and place those needing trimming in stainless bottomed, wire-mesh trays mounted above inspection belts. Other girls do nothing but trim tomatoes from trays. Tray bottoms slope to drain into a trim-waste flume, thus keeping juice off the inspection belt.

There is automatic adjustment of product-flow through instrument-controlled variable-speed drives (Reeves) hooked to sanitary pumps (Waukesha)). Latter feed tomatoes from FMC chopper through heat-exchangers, then cyclone juice to



holding tanks supplying cook kettles.

A counter-flow vertical screw press (FMC) recovers tomato juice from pomace discharged from pulpers, to increase catsup and puree yield.

The pomace is screw-fed into bottom of machine, where an inverted screw cone conveys it upward to form and discharge press cake from the top. Flow of juice is downward past incoming wet solids.

A semi-automatic, company-built 4-valve unit is used to fill glass containers. Jugs are single-file conveyed through enclosed steam-type glass tempering unit for 4-at-a-time manual feeding to filler. An eccentrically driven push-off bar, synchronized with conveyor, carries jugs directly under filling valves. When filled, same bar discharges them onto flat-top conveyor traveling to capper.

A double vacuum-cleaning assembly is hooked to 28-valve bottle-filling machines to prevent excess product dripping from filling tubes and onto bottles and conveyor lines. Alternately, as one vacuum glass container (1-gal. capacity) fills with product drip, the other drains.

Graphic Production Flow Wrap-Up

Details of Brooks' streamlined tomato catsup, puree, and barbecue sauce operations at the company's Mt. Summit, Ind., plant are depicted in flowsheet above. Here, 25 tons of fruit are handled hourly.

Processing starts with fork-truck delivery of a palletized load (21,000 lb.) of fresh tomatoes to two portable variable-speed conveyors (35 and 40 ft.) in 250-ton capacity receiving shed. Crates are transferred from pallet onto conveyors, from which tomatoes are dumped into a 1½x130 ft. flume. With a 300-gpm. water flow, flume washes fruit as it splits into two lines upon entering the plant. Empty crates are removed from shed on cable conveyor.

On each line, an inclined flight conveyor (with overhead water sprays) continues the washing as tomatoes are elevated to rotary reel washers. Here, fruit are exposed to water sprays and air (pressure of 100 psi.). Product next passes over an FMC roller-sorter (3x15 ft.), where unsuitable fruit is removed. Sorting and trimming are carried out as tomatoes transfer to a 70-ft. metal-mat belt, with eight overhead wire baskets into which fruit to be trimmed is collected.

Tomatoes continue to an FMC sanitary chopper. Here, a shaft-mounted 3-bladed rotary cutter and auger chops the fruit and forces it through a perforated circular grid. Crushed product then passes through a magnetic trap as it is withdrawn by sanitary pump (Waukesha). It is now pre-heated to 205-210F. in a Thermovac tubular-type heat-exchanger. Collected in a 150-gal. surge tank, the product is gravity-fed to two FMC pulpers that sieve out skin, seeds, cores, etc. Cyclone juice (about 200 gal. per ton of fruit) now collects in a 100-gal. float-controlled, stainless steel surge tank.

Another sanitary pump delivers the juice to 1,500-gal. stainless supply tanks in the 3rd-floor cook room. Tanks are equipped with electrode-type high-level liquid controls that automatically adjust speed of feed pump.

Pomace from pulpers is conveyed to an FMC counter-flow vertical screw press, where residual juice is recovered and pumped to a cyclone juice-surge tank. Press cake is re-wetted and discharged to sewer.

Cyclone juice, liquid sugar, and corn syrup are metered (Neptune) into 1,500-gal. cook tanks (Langsenkamp). When cooked to proper solids content, vinegar and seasoning are introduced, and product is gravity-fed for straining through 2nd-floor finisher (Langsenkamp) containing a close-fitting screen. Discharged into a 1,000-gal. holding tank, (catsup or barbecue sauce) are now ready for filling into bottles, gallon jugs, No. 10 tins, 5-gal. cans, or even into 4,000 or 5,000-gal. bulk-tank trucks.

Catsup and sauce are hot-filled (195-200F.) and sealed in bottles on two glass lines, each handling up to 450 containers per min.

At start of line, bottles are dumped from re-shipping containers onto a straightline unscrambler that feeds two filling lines. Each line has a glass-tempering unit and a 28-valve rotary filler (Horix). Fillers are adjustable for bottles in a 5½-24-oz. range.

Leaving fillers, glass containers proceed through bottle-finish washer (Anchor-Hocking), capper and coder (White Cap), and company-built, water-spray cooler (75 ft.) with variable-speed drive. Temperature of bottle contents is reduced to 100F. in the 20-min. travel through cooler. Bottles are then packed into shipping cases (labeled or unlabeled), and stacked on pallets for fork-truck transfer to warehouse.—*FE Staff*

PRESSURE-CHAMBER MIXER quickly whips batters, 'mallows, icing creams, and fillings . . .

. . . **THEN TUBES THEM** into hopper of depositor or baking-pan scaling devices.

Newest Trick in Mixing

Unique aerator-blender speeds output, increases product volume and uniformity, slashes ingredient and operating costs

THAT'S a brand new kind of 2-speed, multi-purpose pressurized mixer you see in our left photo.

It's specially built to beat air (or inert gases) into ingredients during the mixing of cake batters, whipped creams, marshmallows, icings, and fillings—even being tried on mayonnaise, salad dressings, whipped potatoes, butter and margarine.

Handled are materials in modest volumes (30, 70, 100, or 200 qt.). Or, where continuous mixing is desired, several units may be hooked in tandem.

Unit is called the pressure-chamber mixer, by its developers (Morton Machine Co., Wishaw, Scotland) and distributor (Syko Engineering Co., Kansas City, Mo.). When introducing it in this country, Syko used Clear Lake Bakery, Clear Lake, Ia., as a research plant. Now more than 30 units have been installed in this country.

Benefits galore

Clear Lake points out these merits:

. . . **Greater production speed.** An angel food cake batter, which took 15-18 min. in standard vertical beaters, can now be blended in 2½ min. A pound cake that took 15 min. can be mixed in 1½. And other cake batters can be produced in about 2 min.

. . . **Fewer mixers.** Company formerly operated four vertical beaters—one 80-qt., three of 160-qt. It now employs one 100-qt. unit, which has trimmed its 7-hr. daily cake production time to less than 5, and takes one man to weigh off, mix and scale 750-1,000 lb. per hr.

. . . **Higher volume.** The bakery is getting 15% more cake volume, or same volume by scaling out less batter. It's reduced scaling of sponge batter (for jelly rolls) into standard bun pan from 3¼ to 2¾ lb. It's also chopped scaling weight of angel batters into pullman pans from 21 to 18 oz., and produced ¼-in. more volume in baked cake. It's producing 1,150 cakes in new unit vs. 1,000 from same ingredients in a vertical beater.

. . . **More uniform quality.** Cakes are more tender and moist, have finer grain and texture. Sponges are more spongy, marshmallows more tender, and whipped creams stand up for days. Frozen batters, when baked, don't fall or shrink after cakes are out of oven for several days.

. . . **Longer shelf-life.** Cakes have at least 7-day shelf-life and recovery on 7-day old stales is 50%.

. . . **Fewer ingredients.** Company has reduced amount of baking powder going into some cakes by 10-20%. It uses none in pound cakes.

. . . **Shorter bake time.** Cakes now bake out in about 10% less time.

. . . **More tolerance.** Batters can be held longer (before going into oven), without product being adversely affected.

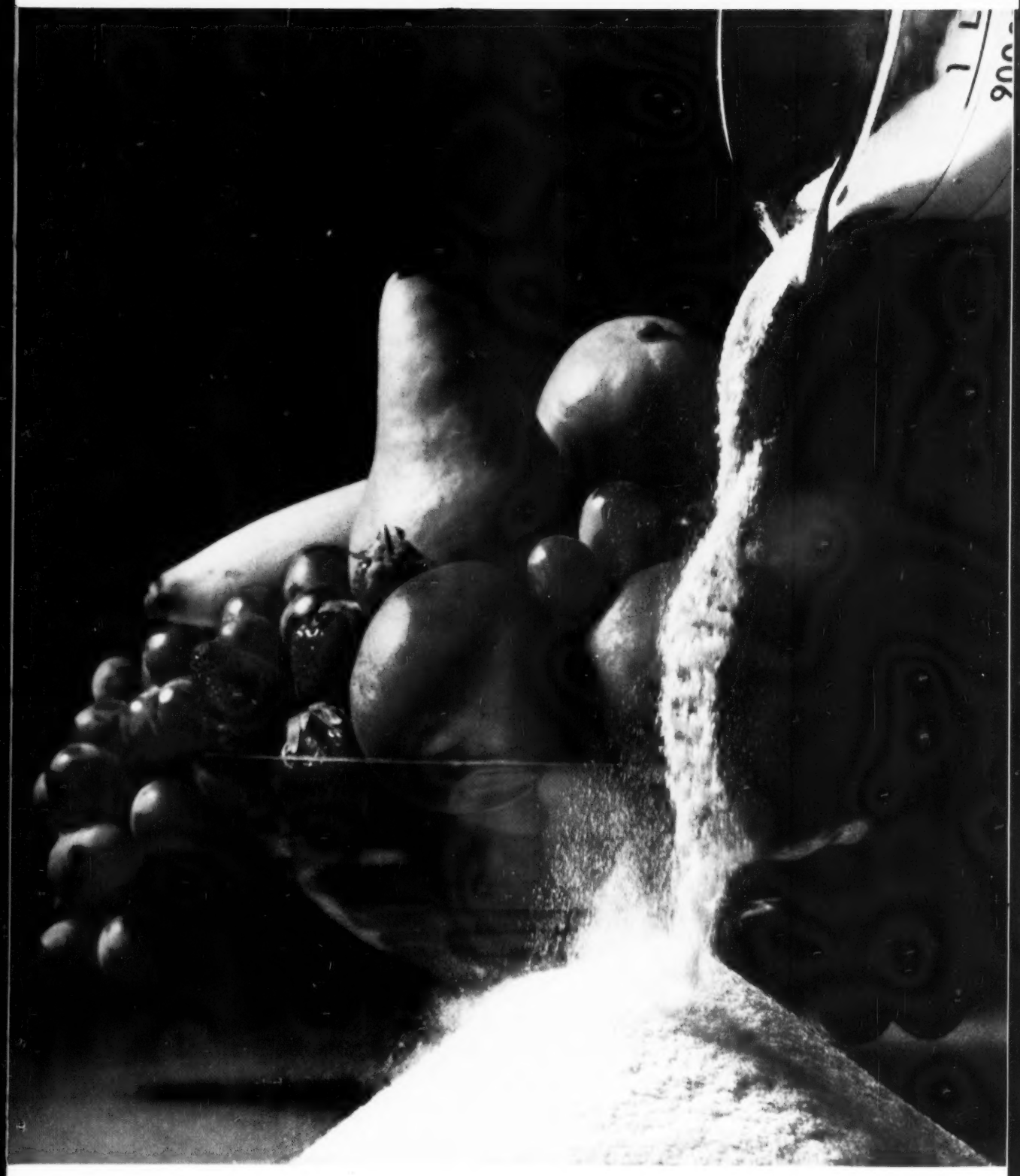
. . . **Fewer handlings.** Previously bowls were disconnected from mixers and hoist-elevated to discharge product into hopper of depositor. Now, batters are air-blown directly through Tygon tube to scaling machine.

. . . **Better control of product heat-up.** It's accomplished through shorter mixing time, temperature-controlled, water-jacketed mixing bowl and less friction.

How It Operates

Before Clear Lake got into production, it worked out cake formulas on a 10-qt. lab-model unit by trying out different air pressures, mixing

For more data, circle 285 on Reader Service Card→



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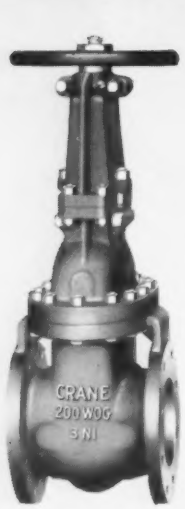
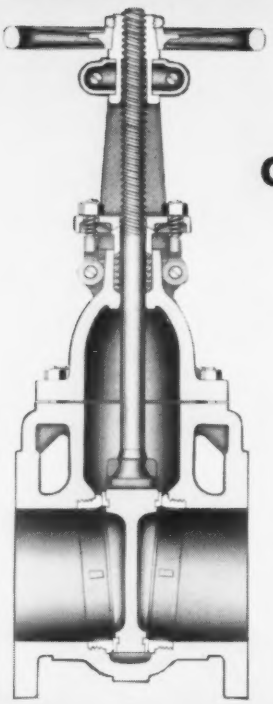
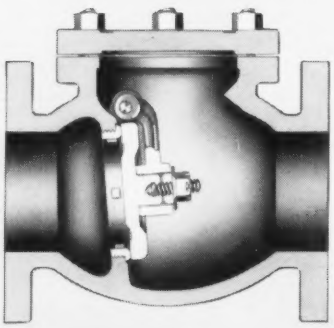




Gates and Swing Checks

18-8 SMo (Type 316) Alloy Trimmed



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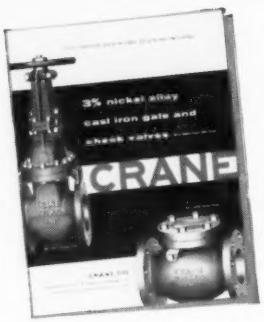
At but slightly higher cost, Crane 3% nickel iron valves provide substantially better resistance to corrosion than ordinary cast iron, and they have notably higher physical properties. Efficiency is stepped up further with Crane 18-8 SMo (Type 316) stainless steel trim.

Typical Recommended Applications: You will save with these valves—in the petroleum industry, for example—on oils containing traces of mineral acids; in wood-treating processes—on creosote vapors and oils; in pulp and paper mills—on alkaline liquors of various kinds. In general, they should be considered where all-iron or brass-trimmed iron valves are subject to seat corrosion.



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times and speeds, then checking batter's specific gravity. This information was used for commercial-size batches.

In operating the unit, ingredients are scaled into mixer bowl. Pressure lid is applied, air (5-22 psi.) is introduced, and the machine started.

Mixing is accomplished by three rows (6 to a row) of rod-shaped beaters. Center row is stationary and outer two are mounted on a horizontal shaft hooked to a 7½-hp. motor that also operates built-in air compressor. Mixing time is pre-set for low (60 rpm.), high (240 rpm.) or low-high blending.

When producing angel cake batter for example, all ingredients except flour are introduced into mixing bowl. Latter is charged into 25-lb. pressure-sealed hopper for auger-feeding to bowl. After air pressure (22 lb.) is applied and machine started, an air valve kicks in high-speed timer for a 2-min. mix. Then second timer operates low-speed mixing for about ½ min., with flour being augered in. When mixing is completed, a button is pressed to open a self-locking, safety-type discharge valve for air-delivery of finished batter through 12 ft. of Tygon tubing to hopper of depositing machine.

In making sponge and other type cake batters, all ingredients are dumped into bowl for a 2-min. mix at high speed. Sponges take 22 lb. air pressure, other batters 12-13. Marshmallow, under 20-22-lb. pressure, is whisked out of the machine after a 3 to 3½-min. high-speed mix.

—*FE Staff*

". . . And we evaluate the reactions of your consumers so accurately that you'll be able to worry about things that never occurred to you before."

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If your production requires sifting, you'll want a Day Ro-ball Sifter data sheet, listing all dimensions and specifications. Write today.

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DAY Ro-ball Sanitary Sifter, just added to our line of sifters, is designed to meet all requirements of the Dairy Institute Code for Grade A Products.

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How bundling fraction-of-case units with Avisco® cellophane can help your retailers

Retailers benefit in many ways when they receive fraction-of-case units of your product bundled in Avisco cellophane. This modern packaging film offers many time-saving and sales-building advantages over the paper wraps and boxes traditionally used for this purpose.

Cellophane enables retailers to use bundles as shelf displays without unwrapping. Bundles of a product can be conveniently stored next to individual packages remaining on the shelf. Retailers can see at a glance how much stock they have and what needs to be ordered. Cellophane bundling also facilitates mass displays during special promotions. In some instances it has even helped retailers sell entire bundled quantities to consumers.

Not only does the transparency of cellophane reveal the full impact of your consumer package—but its sparkle adds dramatic sales appeal. What's more, cellophane is unmatched when retention of freshness is essential. It controls air and moisture and keeps products free from dust. As a matter of fact, people everywhere have come to associate cellophane with freshness and cleanliness.

In addition to increasing the shelf life and sales appeal of a product for the retailer, cellophane eliminates the disposal problem caused by bulky cartons and wraps.

What about the cost? Bundling with Avisco cellophane can offer substantial savings. It eliminates the need for printed and labeled paper wraps or boxes; operates fast and efficiently on packaging machines; seals easier and more securely with heat. And cellophane substantially reduces packaging material inventory and the storage space it requires.

Cellophane bundling also becomes an extra selling tool for you during special promotions. For example, you can use printed cellophane to explain deals and display ideas to your retailers.

We offer a complete packaging service to assist you, and demonstrate how Avisco cellophane, plain or printed, will answer your bundling requirements better and more economically than any other material. Phone or write us for an appointment with our representative in your area or a selected cellophane converter specializing in your field.

Learn more about cellophane bundling. Send for this FREE handbook—"Cellophane Bundling . . . newest concept in distribution packaging."

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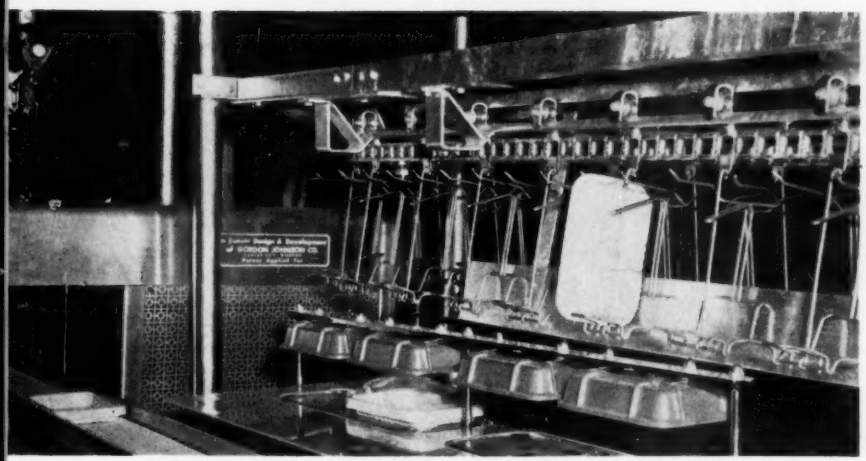
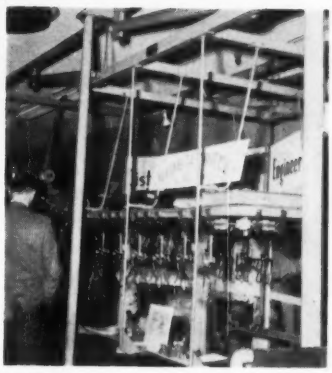
6 New Units for Better Packing

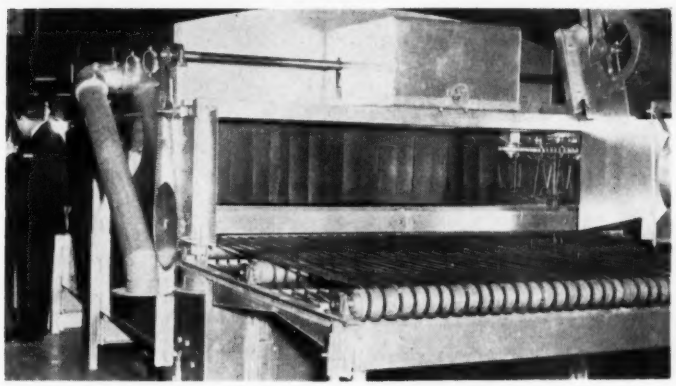
Latest packaging, chilling, and product-handling systems in spotlight at Kansas City show of Institute of American Poultry Industries



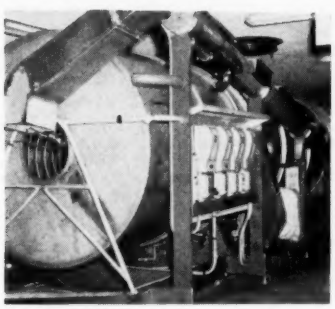
CHILL-PACKING line employs polystyrene tray dispenser, chicken-parts cutting-packing station, polystyrene-lid dispenser, air-operated 4-head heat sealers, and conveyorized spray-type chiller.—Gordon Johnson Co., Kansas City, Mo. (42)



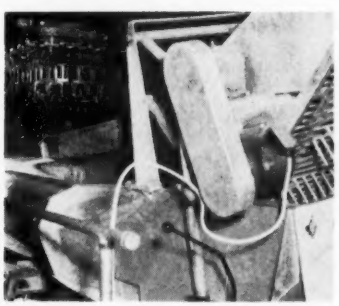
FLEXIBLE monorail conveyor system can be automatically raised or lowered to any working level for easier hanging or unloading of shackled birds.—F. H. Bathke Co., St. Paul, Minn. (43)



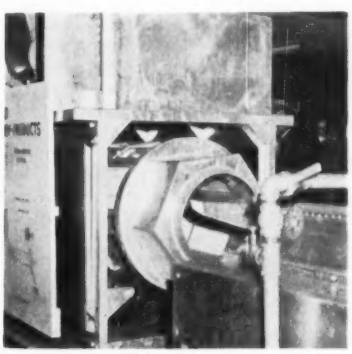
SPRAY-TYPE chiller conveys birds—and even tray-packed, cut-up fryers—through circulating propylene glycol.—Gordon Johnson Co., Kansas City, Mo. (44)



CONTINUOUS chiller comprises rotating stainless drum with slush ice-circulating pump. Poultry is screw-conveyed through unit and gently agitated in ice-water slurry. First-stage precooler may be used with basic unit. Maker: Morris & Associates, Inc., Raleigh, N. C. (45)



ROCKER unit continuously cools eviscerated birds to 40F., or below, in circulating ice water at rate of 3,000 broilers (3-lb. weight) per hr. Chilling takes approximately 30 min. Displayer: Barker Poultry Equipment Co., Ottumwa, Ia. (46)



BYPRODUCT unit continuously grinds offal. Incorporated are tank-type agitator, rotary screen rinser, and auger-type dryer. —Barker Poultry Equip. Co., Ottumwa, Ia. (47)

INDESTRUCTIBLE
SLAB CONVEYOR BELTING

TWICE THE QUALITY OF OTHER SLABS— YET THE COST IS THE SAME!

Low-cost, Long-life **Conveyor Belting** —straight to you from your "U.S." Distributor's stocks—

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U. S. Indestructible® Slab Belting is the low-cost belting especially suitable for a wide range of uses by industry. It is the right belt for light assembly line work and horizontal (and slight incline) package material handling. Your "U. S." Distributor cuts the conveyer belting slab to the size of your conveying equipment, and delivers it to your plant without delay.

U.S. Indestructible Belting is the long-life belting because it is made of flexible *natural* rubber, with thick coatings of supple natural rubber between flexible sturdy duck. The belt is orange-colored, with friction surface and skims. It has much higher adhesion than any other slab, yet costs no more. It fits the smaller pulleys of package handling equipment.

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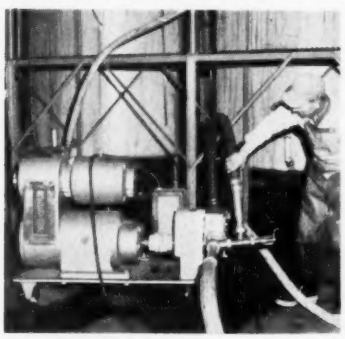
Anti-Choke Air Valve Clears Line Stoppage

Here's a neat way to assure continuous flow of dry products such as breakfast cereals from storage to fillers.

It comprises an anti-choke valve, main part of which is a diaphragm connected to an entry trap in a compressed air line attached to the product feed line. Diaphragm is actuated by difference in pressure between points in the feed line.

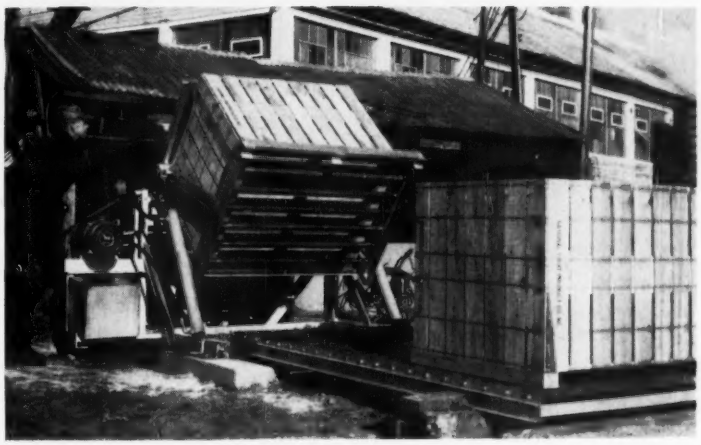
When an obstruction develops, entry valve opens admitting air under pressure to feed line, which causes product to move on to filler. As pressure difference between check points decreases, air valve closes and normal flow is resumed.—*FE Staff*



Portable Vari-Speed Pumps Solve Transfer Problems

If you pump products of different concentrations and at varying rates as we do, then you might consider switching to portables with variable-speed drives. Such a pump is wide open when handling single-strength juice, then it can be adjusted for, say 1,000 gal. of concentrate per hour.

In our plant we are using four such pumps with 6-1 ratio Reeves drives to: (1) Move fruit concentrates from any of 5 coldwall storage tanks for direct filling into polyethylene lined steel drums, (2) load single-strength juice into tank cars from cooler storage, and (3) feed blended punch drinks from mixing-standardizing tanks to filler bowl in canning department.—*John Murch, Production Manager, A. F. Murch Company, Paw Paw, Michigan.*



Pallet Boxes, Hydraulic Dumper Cut Handling Costs

Speedier and safer handling, and savings in labor at large apple orchards in Virginia have resulted from adoption of 18-bushel wirebound pallet bins (to replace small field crates), and a hydraulic dumper (photo).

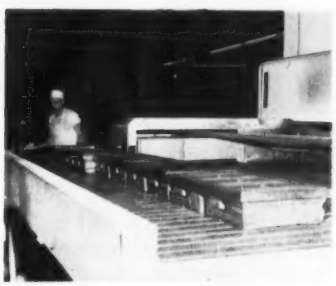
Bins are strategically placed throughout the orchards for convenience of picking crews, who empty their sacks directly into them. Fork-lift vehicles then pick them up and move them either directly to packing sheds or storage, or to loading areas where the bins are assembled before being hauled from the orchard.

At packing sheds, bins are placed on roller conveyor that feeds the hydraulic dumper. Apples fall onto conveyor and move inside shed for processing. Fork truck then returns empty bin to orchard.—*FE Staff*

Batching Made Dust-Proof

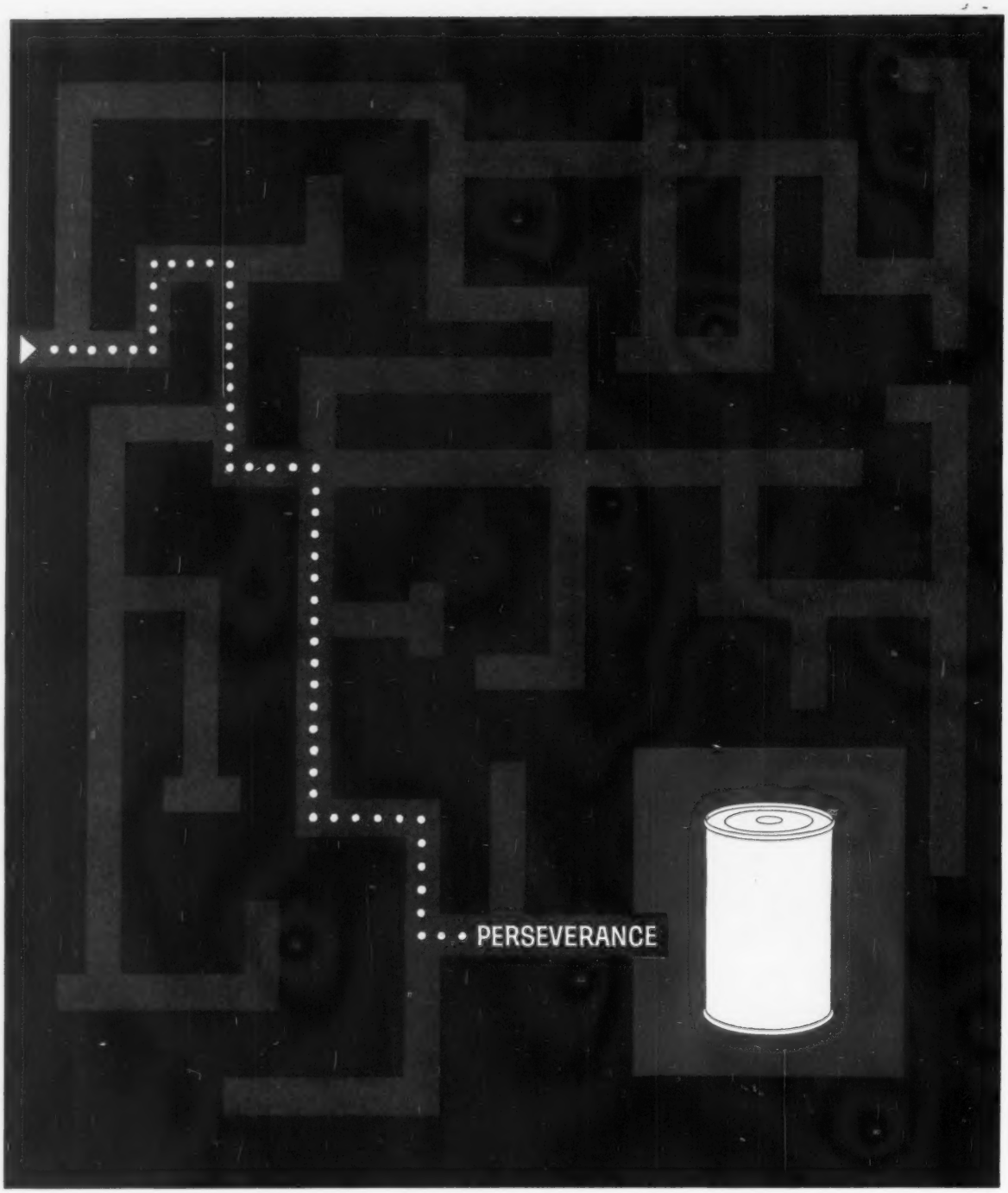
Loading-ports of ingredient blending tanks in our new plant are set level in a mezzanine floor to enable easy charging from containers deposited there by lift trucks.

Ports are equipped with heavy, permanent manhole covers. But to prevent foreign materials from falling into a tank during charging we fabricated a lightweight, stainless, dust-proof assembly (photo). Between dumping of various ingredients, lightweight cover (far right) is used. When tank is fully charged, manhole cover is replaced.—*C. W. Richard, Production Manager, Orange-Crush Co., Evanston, Ill.*



Gently Unloads Bake Oven

To eliminate the beatings normally taken by pans, trays, and baked goods while being discharged from ovens, I devised an automatic system for



Canco's perseverance has been rewarded with most of the major advances in canning technology. This determination to find the *right* way has helped us solve countless special problems for our customers. That's why Canco has a reputation for alert, imaginative, cooperative service —the kind that can help make your operation *more efficient, more profitable*. The Canco salesman will be glad to tell you more. Give him a call today!

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gently unloading them in our new bakery.

Here's how it works: Pans or trays coming out of the 10-ft. wide oven are first transferred to a 4-ft. walking beam type conveyor. Next, they proceed onto a conveyor consisting of 4-in. spaced chains. Speed of this unit is synchronized with oven discharge and walking beam conveyor. When chains are filled with pans, however, latter break beam of a photoelectric eye causing chain speeds to double and, thus, slide the pans onto 2½ ft. wide, flat-top unit (left in photo).

Photo cell is crank adjustable along length of oven unloader according to size of pans or trays. And a calibrated chart has been mounted on unloader panel as a guide to the operator.

To make operation foolproof, we've installed two limit switches. One is actuated when pans aren't aligned for full clearance of cross conveyor, other when hinged guard tilts back in event of pan jam-ups on cross-conveyor. In either case, all conveyors (ovens, too) stop, and a squawker sounds.—*Minos Asproyerakas, V. P. & Chief Eng., National Baking Co., Chicago.*

Group Relamping Cuts Cost

In any large lighting installation, spot replacement of lamps is expensive. For significant savings, group relamping is recommended.

Here's why: Average rated life of fluorescent lamps is 7,500 hr. Records shows that most burn-outs occur after 6,000 hr.—80% of rated life. So, if you group-replace at 6,000 hr., you eliminate most of the spot replacements.

Here's how it's done: First, replace all your old lamps with new

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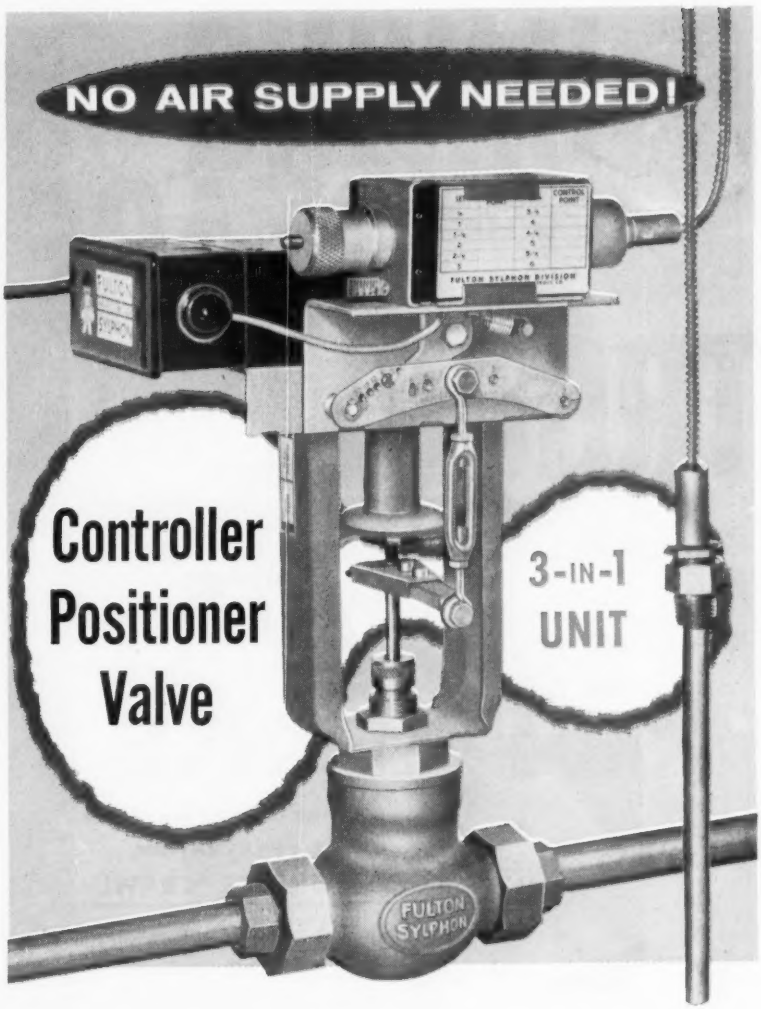

Complete, Pre-assembled Electric Modulating Unit Controls Process Temperatures at Less Cost!

Right on the heels of the recently introduced FultroMatic air-actuated unit, Robertshaw engineers perfect this electrically operated version, the Fultro Lectric.

This low-cost combination Controller-Positioner-Valve provides modulating control of critical processes at about one-half the cost of two- and three-unit systems.

- **Dependable accuracy:** element responds to minute changes
- **Positive valve positioning:** no overshoot
- **Adjustable proportional band** easily changed on the job
- **Simplified settings:** easily reproducible
- **Field reversibility** for changing control action
- **Easy to install:** place valve in line, mount bulb, connect power
- **Low maintenance:** rugged design for trouble-free service

For complete details and specifications, write for Bulletin JG-756

Robertshaw-Fulton CONTROLS COMPANY

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HAVING PACKAGE TROUBLE BECAUSE OF FATS GREASE OILS ?

GREASE-PROOF PATAPAR
STOPS PENETRATION
NO GREASE "CRAWL"

THE TEST: Drops of oil placed on this Patapar remain on the surface indefinitely. The oil will not spread or "crawl." No seep through.

As a packaging material, or wherever a grease-proof barrier is required, new types of Patapar Vegetable Parchment provide positive resistance. With these grease-proof Patapars there is no penetration. Oil will not spread on Patapar's surface. There is no grease crawl—no "wetting".

Patapar is used alone for packaging, or laminated to other materials for end uses such as fiber drums, spiral tubes, cartons.

Patapar gives you WET-STRENGTH, too

High wet-strength is a basic quality of the many different types of Patapar. And, made from pure cellulose, Patapar is odorless, non-toxic. *It is furnished plain or colorfully printed.*

If you would like to test Patapar, write us telling your requirements. We'll send technical information and samples of the type we recommend for your purpose.

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West Coast Plant: Sunnyvale, California · Sales Offices: New York, Chicago

SPECIAL PAPERS FOR SPECIAL PURPOSES

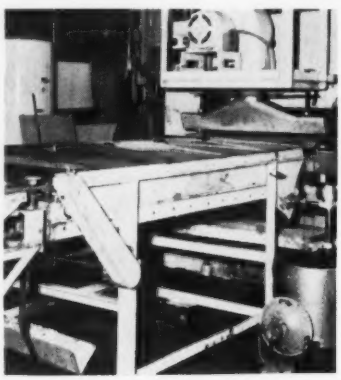
Practical Ideas

ones, but save 20% of the old ones that look good. Then as burn-outs occur, replace with those you saved. By the time these are used, your entire installation will have burned 80% of its average life.

At this point you again group-replace all lamps, saving 20% for replacements. On the basis of $3/hr. labor, cost for 100 lamps looks like this:

	Spot Replacement	Group Relamping
100 lamps, 84¢ each	$84.00	$84.00
Labor (20 min. avg.)	100.00	
Labor (2 min. avg.)		10.00
Labor (replace 20% interim burn-outs at $1/lamp)		20.00
Total	$184.00	$114.00

—*Westinghouse Elec., Pittsburgh.*



Chocolate Recovery System

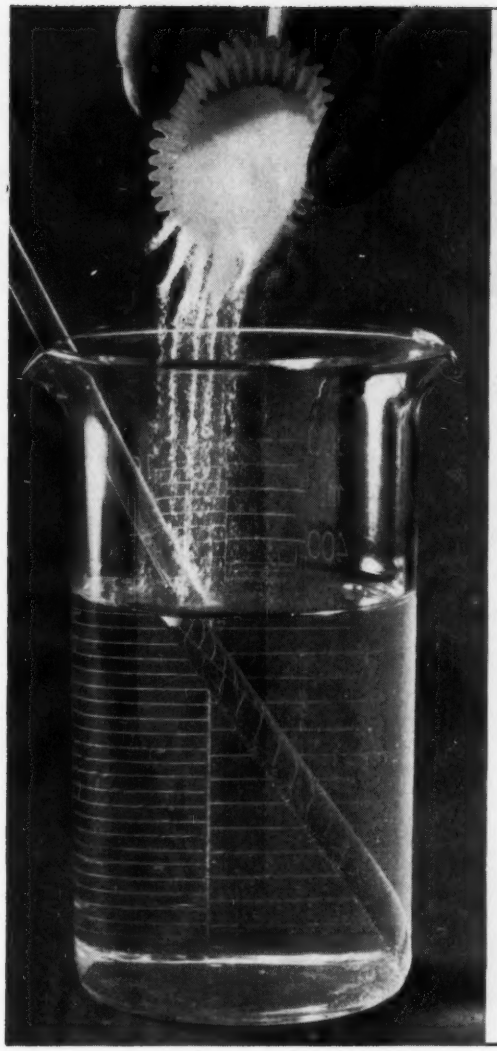
Good way to collect excess chocolate coating that drains from cookies as they are conveyed to cooling tunnel is to use inclined, hooded extension (photo) from chocolate enrober. Extension comprises 10-ft. wire-belt conveyor, over which cookies travel. Surplus coating drains from cookies and collects into V-shaped hopper, from which it flows into catch-bucket right. Extension is enclosed with a 6-section cover to keep coating warm and free flowing.—*FE Staff*

Re Drum Emptying

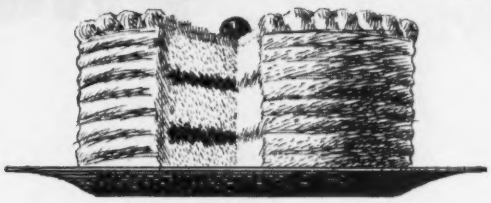
Readers comment that the item, "Empties Fat Drum Fast" (FE Feb., p. 83) might be interpreted as suggesting 50-psi. steam to blow out the fat.

This wasn't the intention—the steam's prime purpose being to make the fat flowable (very low pressure dry steam does it).

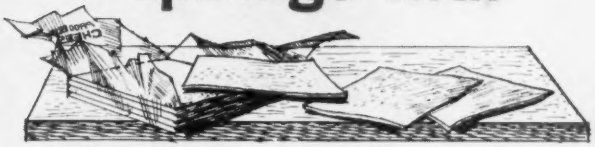
Of course, no one should use steam at any pressure without approval of equipment and procedures by a licensed engineer.—*The Editors*



protect foods from



spoilage with



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Both Sorbistat-K and Sorbistat (the acid form) are effective growth inhibitors for many yeasts and molds which cause spoilage in cheese and cheese products, pickles, fish, prepared gelatin fruit salads, potato salads, chocolate syrups, pies, cake, and fruit cake.

It is important to note that Sorbistat-K *selectively* inhibits molds and yeasts, without interfering with normal microbiological curing of cheeses.

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EXCLUSIVE COMBINATION!

Only P-K Vacuum Tumble Dryers offer pre-tested, pre-packaged savings. In pre-testing, results are predicted with a detailed procedure report and test samples. In pre-packaging, a single source of responsibility delivers a tailored, thoroughly proved assembly at a cost far less than a do-it-yourself project.

Compared to tray drying, the advantages of P-K Vacuum Tumble Dryers are overwhelming. Drying is many times faster. Expensive solvents are condensed and recovered. And caking that requires separate pulverizing and screening steps is eliminated. This greatly reduces handling. It often saves enough in labor costs to justify investment. It safeguards against product contamination.

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Pre-packaging utilizes P-K's specialized knowledge of companion equipment and parts. Units arrive completely assembled, fully balanced and ready for use. This eliminates costly, do-it-yourself trial and error during assembly and installation. Moreover, it saves engineering time and overhead from design through purchasing and start-up. You can even see the difference! A neat compactness saves space and makes production areas look better.

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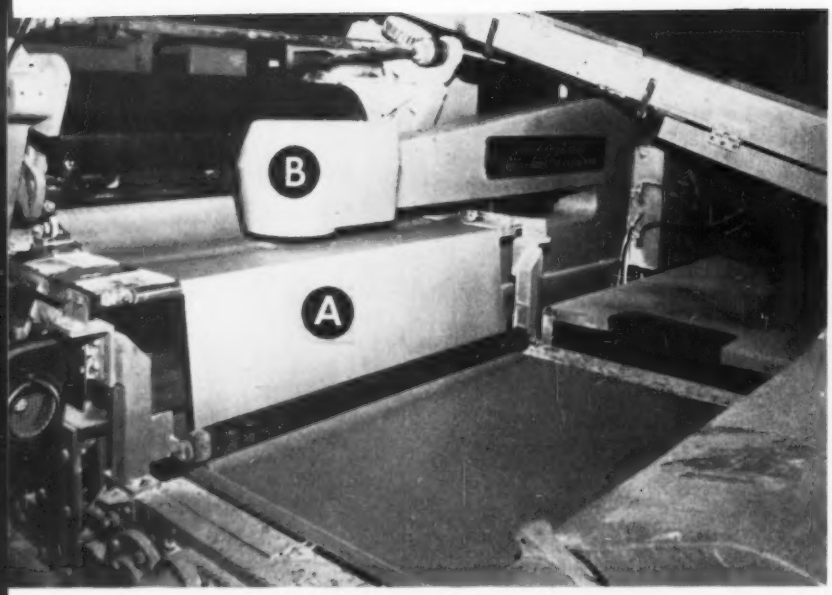
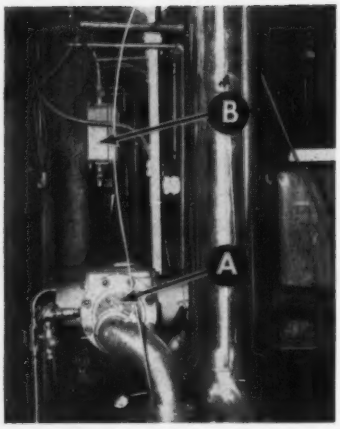


HOW RAYS HELP BAKER. Thickness of cracker-dough sheet (A) is continuously measured by detector (B). Then signals are transmitted to control unit (not shown) that records sheet thickness and actuates feedback to make any needed correction in roller setting.



DENSITY of grape juice concentrate is continuously measured by source-detector (A). Amplifier (B) boosts electrical signals fed to recorder-controller that automatically opens or closes pneumatically operated valve on finishing evaporator's discharge.

FE Roundup on Radioisotope Devices

Your 'Ray' Way to Better Control

EXCITING THINGS are opening up in the field of food-process control and production research, thanks to use of radioactive isotopes. And extra dividends await those who take advantage of these versatile tools requiring little capital investment.

Radioisotopes are valuable for determining or controlling density, moisture, thickness, fill of containers, product levels in tanks and bins, mixing operations, and product composition.

They're proportioning product streams, assessing stability of certain additives, solving precipitation problems, gaging wall thickness of jacketed kettles, boilers, etc.

These isotopes also are pinpointing leaks in inaccessible pipelines, radiographing welds in them, evaluating CIP efficiency, radio-assaying products for residual toxic pesticides, ascertaining physiological effects of certain food additives in test animals, and studying migration and absorption of package-material compounds by food products.

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

How They're Used

As radiation sources, their emission—for gaging and controlling purposes—are employed in these two basic ways:

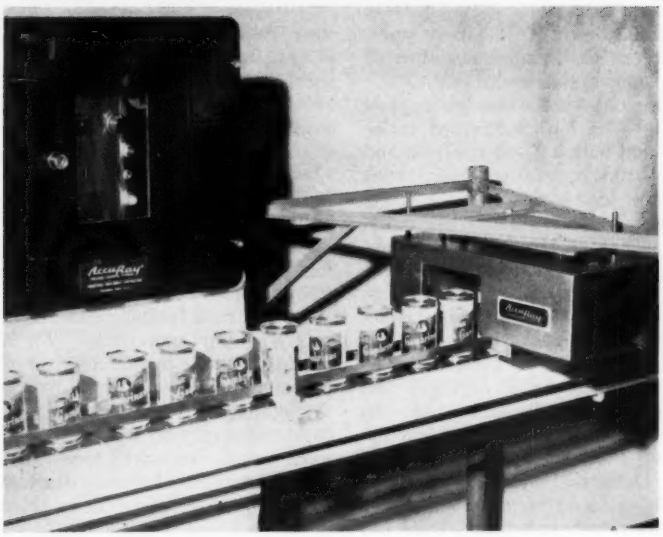
A. Testing: How a target material (food or container) effects a sealed isotope-radiation source furnishes information about it. Radiation penetrates or reflects from the material, and is measured. It's this material-penetrating ability that's led to the most extensive industrial use.

B. Tracing: A tagged or "labeled" chemical, mixed with a minute amount of radioisotope, can be traced through a process or system by a Geiger counter. So tiny an amount as one hundred millionth of an ounce can be detected in 1,000 gal. of cleaning solution. But more important is the specificity of the tracers—labeling specific batch of atoms traced through a series of processes, for instance.

What makes them so effective is that neither temperature, pressure, or chemical reactions can change their identity or cover up their presence from sensitive detecting devices.

Basic components of any measuring system employing nucleonics are radiation source and detector, with the material to be measured or traced as the variable. For tracing purposes, the material serves as the carrier of the radioactivity.

In measuring, the absorption or reflection of nuclear particles from a known-strength source is calibrated in density, thickness, distance (between absorber and source), etc. Information picked up by a detector (read immediately or recorded) can then direct automatic control systems. Detecting is accomplished with such electronic instruments as Geiger, scintillation, or proportional counters, as well as ionization chambers.



CONTAINER FILL is ray-checked at 1,000-cpm, then improperly filled cans are ejected from the conveyor line.

Applied in striking new techniques, penetrating radioactive isotopes are taking on more and more process tasks—detecting, checking, and regulating. Here are numerous ways you may trigger them in the food plant to get faster, more accurate operations

When a particle of radiation enters a Geiger counter, for instance, it ionizes a gas and triggers an electrical charge. And this small current is amplified to produce a signal that's seen, heard, or counted.

Or, number of counts (gamma rays) passing through process material to counter tube, which is proportional to product density, is interpolated to gage or control level and density. Any variation in product density shows a corresponding change in recorder-controller. System is also applicable for liquid-level and interface-level indication of products of different densities.

In a scintillation counter, these radiation particles create minute light flashes in a liquid or crystal as the disrupted molecules emit energy in recombining. A light-sensitive device then converts the flash into a tiny current that's amplified.

A proportional counter is like the Geiger, but records pulse rates faster, though not as fast as the scintillation counter. It's also similar to an ionization chamber, in which radiations enters a gas to create ion pairs (free electrons) that are collected to form electric current.

Isotopes in Action

Here are some of the ways industry is putting these invisible sleuths to work:

1. Gaging density: Gamma-ray gages (16)* are instantaneously measuring and continuously controlling density (mass per unit area) of products more uniformly than ever before.

Specifically, they're now automatically adjusting output of evaporators to maintain solids' percentage in concentrated products at a constant value (FE Nov. '58, p. 81).

At present, they're measuring and controlling density of concentrated fruit juices (apple and grape), tomato paste, condensed milk, prune concentrate, and raw washed sugar in melters. They're also controlling fat content in baby foods and, thereby, improving quality. Further, only a minimum amount of water is lost. Here, precooked meat is introduced into a centrifuge, with a beta density gage in the fat-outlet stream automatically throwing a switch to dump meat when gravity increases from 0.80 to 0.85.

Large corn refiners have been exploring use of the gages to control densities during starch-gluten separation in centrifugals

2. Controlling bulk density: Now being employed on a packaging line to assure more accurate filling of such powdery-type products as agglomerated milk solids, is a brand-new bulk density gage (17) that consists of a sealed source (Strontium-90) and detector (ionization chamber).

Unit is mounted to discharge of surge hopper feeding filling machine. Product flows between source and detector. Variations in intensity of source-radiation, picked up by detector, produce variations in electric current that are amplified to automatically control fill into machine's cups.

Tests with milk solids, for example, revealed density changes as high as 50%. And 15% of the containers varied from pre-set weights.

3. Measuring product thickness: Soda cracker thickness is now being controlled in-stream by a 3-component electronic system (18) that gages dough sheet before it enters oven and accurately makes compensating corrections and records data. Intensity of radioactivity detected by Geiger or scintillation counters is directly affected by sheet thickness. This type control: (1) minimizes product giveaway; (2) holds cracker weight constant; (3) improves taste and appearance; (4) reduces burned or deformed crackers and (5) cuts tearing or marking of dough sheet.

Beta-radiation measurement might be applied to cookies, noodles, chewing gum, candies, sliced cheese, meats, etc. Some units would operate on amount of radiation passing through product, others on the "backscattering" principle—detector on same side of work as source.

Reflection-thickness gages might be useful in accurate measurement of coatings. In this technique (now used in other industries), beta electrons from a radioisotope strike an uncoated product, and the intensity of the reflected beam is measured.

(Turn page)

* For more information on these gages, circle this number on Reader Service Card at back of issue. (Other pertinent equipment or systems mentioned in this article will be found similarly keyed for your convenience.)

Small Outlay, Big Savings

Revealing the high rate of return enjoyed by food companies through use of radioisotopes are results of a recent study by the National Industrial Conference Board.

On an annual investment of $32,000, the food industry, reports the Board, is making direct savings of more than $800,000. Indirect savings (not included in the study) should increase the amount considerably.—The Editors

Coated, it reflects a different number of beta particles. The differences represent variations in thickness.

Look for accurate control of individual slices of cheese and bacon. Being attached to automatic slicing machines is a bulk density gage (19) employing a scintillation counter. Slab of product is placed between source and detector and, upon measuring its bulk density, a feedback system automatically controls feed.

Employing the same principle is a device (20) now being attached to pouch-making and filling machines. Roll-fed film passes between a source and detector that picks up flaws in thickness to automatically reject pouch prior to filling.

4. Measuring and controlling tank levels: Radioactive liquid or solid level gages (21) are based on the principle of measuring changes in intensity of a beam of radiation from a fixed source. Shielded source is mounted on one side of tank, with radiation detector on other side hooked to an amplifier. Any interruption of beam, as when product rises above or falls below detector, is employed to start or stop a pump or monitor an alarm.

Level-controlling systems may be of the on-off switching or continuout level-measuring types. Outside mounting of source and detector thus avoids fouling by products, and controller is readily accessible.

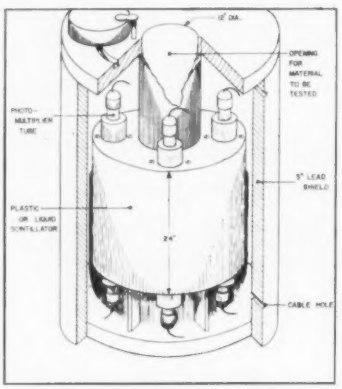
Liquid-level systems may be of the predetermined level or continuous gaging types. Former employs a radiation source inside or outside a tank and a scintillation detector outside tank in line with desired level. When product rises to level of source and detector, level is automatically controlled (and maintained) through valves and drains.

The continuous gaging type employs a radioactive source that is inside a float that follows the level of liquid. Changes in level are detected by a scintillation spectrometer. This change is calibrated in volume or linear distances.

Control systems may be applied as high- or low-level alarm units, wide and narrow band controls, and wide band control combined with high-low level alarm.

There's no reason why liquid levels couldn't be measured in high-pressure, high-temperature insulated kettles. Gage would sound an alarm when high level is reached, and automatically shut down process if corrective action isn't taken within pre-set time. Such gaging could prove more economical and less troublesome than a float-system operating through high-pressure scale.

5. Detecting interface levels between liquids having different gamma ray-absorption coefficients—as oil and water control (22). Interface measurement can be made either in a tank or pipeline.



"MEAT COUNTER" gages lean-to-fat ratio when stream of constant bulk density passes through unit.

When a small amount of short-lived radioactive-tracer is introduced in a pipeline and interface arrives at a junction point, emitted radiation is picked up by detector and translated into electric current that activates an automatic control. Liquid is then shunted to desired direction.

6. Controlling fill-height in containers: Control system (23) makes non-contacting measurement of liquid or dry fill-height in containers (cans, glass, cartons, etc.) at speeds up to 1,000 per min. It also actuates feedback control of filler whenever product level rises above or falls below specifications. Accuracy is ±$\frac{1}{64}$th in.

7. Inspecting-rejecting containers: System (24) measures fill of cans conveyed at 1,000-per-min. before or after closing operations. It energizes pneumatic or mechanical device that rejects slack-fills or over-fills.

8. Measuring flow in continuous process: A patent-applied-for method (25) overcomes losses of radioactivity—by isotopes between source and point of use, and during storage. New technique employs, in product stream, a non-radioactive tracer that's made radioactive for a split second.

Available is a system for measuring and recording mass flow (26). It provides minute-by-minute data on production rates with regard to total throughput or, when desired, one constituent may be separately measured. In one case (not a food plant), it's reported that by measuring and totalizing dry solids flow, plant throughput was increased 25%.

System comprises density gage externally mounted on material line and feeding to a recorder, as well as a magnetic flow meter hooked to a second recorder. Both recorders, feed their signals to a third recorder. Latter, receiving gravity and flow signals, multiplies them so that they are read in pounds.

Of potential use in the food industry is a radiation device employed by an oil firm to measure specific gravity of incoming dual stream. An alarm system functions when interface reaches plant. In this case, a special cell, mounted on one side of a pipeline with a radioactive source on other side, picks up and measures rays passing through the pipe. Output of cell, which is amplified and recorded, indicates specific gravity.

9. Spotting leaks: Radioactive tracers are being used to locate leaks in inaccessible pipelines. Here, a small amount of isotope is introduced into a line and, after the system is flushed, path of its radiation is followed by Geiger-counter until it reaches a spot where radiation drops off.

Another application was in finding a leak in a radiant heating system in a 15,000 sq.ft. concrete garage floor at the Canadian brewery of John Labatt, Ltd.

Washing soda activated in the atomic pile at Chalk River was the key to the problem. The soda, with a short half-life (15 hr.), was dissolved in water and introduced into system. Following thorough flushing, exact location of leak was spotted by radioactivity remaining within 6 in. of concrete.

Method could be used to trace leaks in refrigeration systems.

10. Probing welds: Labatt inspectors traced the cause of an abnormal amount breakage of grain in a carrying system linking rail cars to storage silos. Method involved radiographing of welds in the pipeline suspected as causing the breakage. But radiographs proved this untrue—and trouble was subsequently located in the receiver cone.

11. Testing steam jackets: Also checked at Labatt was possible development of thin spots in the steam jacket of 10,000-gal. copper kettle. Employed was a gamma gage (¼ curie of iridium-192 source) and the reflection principle. Recordings, when plotted, gave a complete profile of jacket, showed it to be in good condition.

12. Checking cleaning efficiency: As in looking for a pipeline leak, a patent-applied-for tracer method (27) determines efficiency of CIP equipment. Basically, method employs radioactive iodine which, when in solution, is absorbed by organic residues in the system. Then residues are determined with a Geiger counter.

13. Eliminating static: Radioisotope radiation is used to ionize materials it strikes—as ionizing air at selected points along moving material (packaging film, for example)—and thus ground static electricity.

14. Measuring lean-to-fat ratio in meats. A new scintillation counter and analyzer (28) identifies and gages intensity of radioactive potassium in lean meat (there's none in fat and little in bone). "Counter" measures total amount of potassium in the meat to determine its "lean-body" or "fat-free" mass.

Instrument is also applicable where atomic number varies. It's being employed to monitor coal-ash ratio. Possibility of adopting it for continuously measure of ash content of bakery flours is foreseen.

15. Testing product moisture: Employed in other industries are radioactive source-detector and electronic recorder, both housed in a probe that's lowered into a car, bin, etc. Used is a neutron source actuated by alpha or gamma rays.

Available soon will be a 'moisture counter' (29) that employs neutrons from a radium-in-beryllium source to bombard unbound moisture. Neutrons slowed down by water's hydrogen are totalized, and number of counts interpolated to gage moisture content of food.

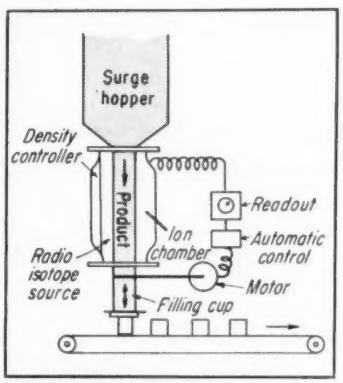
16. Tracing pesticide residues: A small portion of pesticide, synthesized from radio chemicals, can be used to treat control crop. After growth, crop is harvested and processed. Radio-assay will show if pesticide appears in food product and, if so, in what concentration.

17. Learning about food additives: When carrying out animal tests on physiological effects of an additive, tracer techniques easily ascertain amounts metabolized and passing through body. Concentrations of additive can be readily pinpointed in specific body areas or organs.

18. Study packaging materials: Unsafe plasticizers, stabilizers, antioxidants, and other plastic package-compounding materials like inks, adhesives and coatings migrating into or absorbed by foods can be checked by tracer techniques.

Potential Applications

Easy to conceive is use of radiotracers in laboratory and pilot plant studies. For example, in following mixing operations—as in fortified foods, also in baking, cereal, and dairy fields. There's an optimum blending time. Too little results in non-uniform products, too much, slows mixing. High-dilution or short-lived tracers would avoid appreciable radioactivity in batch-tested product and would determine optimum mixing time to bring about economies.



BULK-DENSITY CONTROLLER assures more accurate filling of powder-type food products.

Mixing would be measured (and controlled) by detecting small amounts of tracer in one of the ingredients. Constant counter readings would indicate uniform mixing. Procedure could also be applied to study blending process as an aid in designing equipment.

Due to sensitivity of detecting instruments, amounts of radioactive tracers would be so small that there'd be no danger to plant personnel. Too, tracers (with OK of regulating officials) could be selected with sufficiently short decay time so that, by the time the product leaves a plant, it wouldn't be radioactive or dangerous.

Such studies have already been carried out in dough mixing by tagging the fat with I-131.

Likely is use of these tools to measure precipitation of solids, as in wine-settling. They may also guide machines (in place of workers' hands) for cutting meats. Or, to borrow an idea from the cigarette industry, they might control density (also flow, fat-to-lean ratio, etc.) of sausage emulsions being stuffed. Methods would control product uniformity, save on raw materials, and minimize consumer complaints of off-standard products.

A thickness gage might be placed across a stream of meat emulsion as it enters a casing. Intensity of radiation would measure amount of emulsion in large casing, hence firmness of product. Amount of emulsion could be determined instantly and controlled by strength of signal to maintain constant thickness with great accuracy and rapidity.

Recent research on "gamma trays" or "pans" for extension of refrigeration shelf-life of perishables may find industry use in the not-too-distant future. Satisfactory extension of shelf-life (about 1½ times more) was test-obtained by holding foods on trays with a small amount of cobalt-60 in intermediate layer of porcelain enamel coating.

Automatic control of remotely located booster pumps with the aid of radio-tracers is a possibility. Otherwise, these pumps would demand the attention of several men.

Particular acknowledgement is made to the following persons for their assistance in the collection of material and illustrations: Lewis Shere, The Diversey Corp., Chicago; Paul M. Werth, Industrial Nucleonics Corp., Columbus, Ohio; Karl T. Ball, Instruments, Inc., Tulsa, Okla.; John B. Cronyn, John Labatt, Ltd., London, Canada; D. D. Pearson, Nuclear Electronics Corp., Philadelphia; Gordon Hickenlooper, The Ohmart Corp., Cincinnati; S. Regas, Radiation Counter Labs., Inc., Skokie, Ill.; Al Piranian, Tracerlab, Inc., Waltham, Mass.; J. P. Aldworth, Nuclear-Chicago Corp., Chicago; and T. C. Grunau, Canadian Curtiss-Wright, Ltd., Isotope Products Div., Oakville, Ontario.

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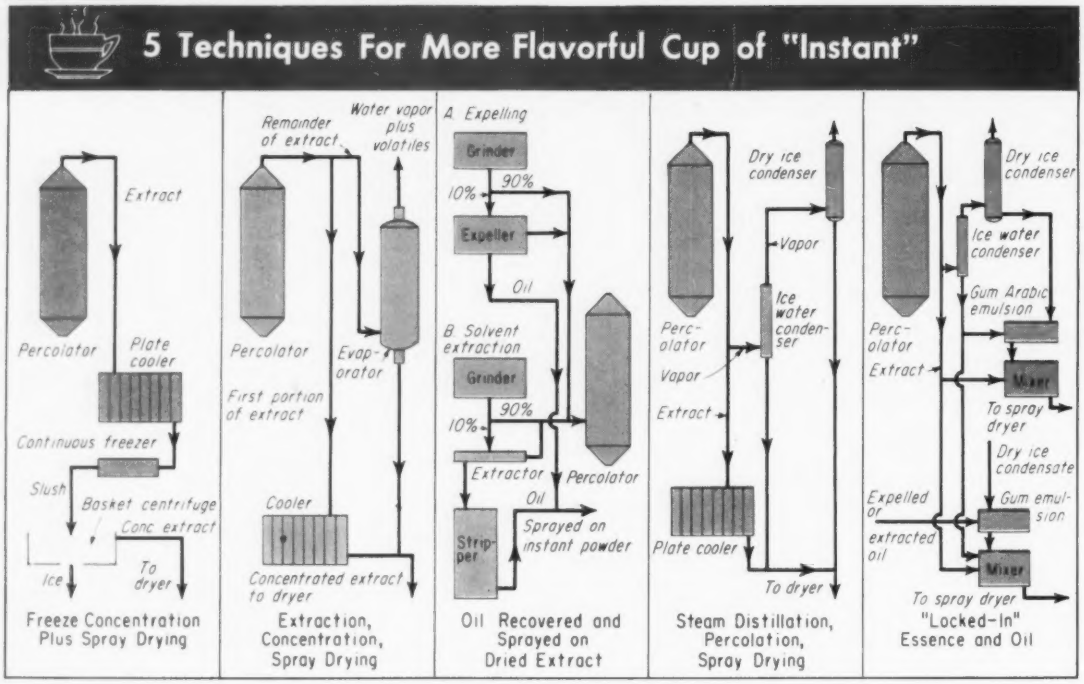

Target: Improved Soluble Coffee

Both aroma and flavor of 'instants' seen boosted by freeze concentration, essence recovery, solvent extraction of oils

"AROMATIZED" INSTANT COFFEES as produced today leave a lot to be desired in quality. But crash-type attacks on the problem, guided by sequential-flavor knowledge, are under way in many laboratories.

Natural fugitive aroma, volatile steam distillates, and vegetable-type oils are being commercially recovered to fortify the coffee flavor. And gas packaging, with less than 1% oxygen a requisite, has been found absolutely necessary, for long shelf life.

Behind the Flavor Trouble

Several things account for the poor quality of some "instants". Most important are: Low quality of green beans, mistreatment of roasted coffee, and faulty percolation and drying techniques.

Progressively higher yields, largely achieved through hydrolysis, have been overly emphasized as the prime causes of poor flavor of instants. True, higher yields dilute the flavor and tend to give a more acid cup, but much of the deterioration attributed to them is not substantiated.

To demonstrate the source of coffee flavor, one need only smell the discharge vent gases, condensate, and extract from an espresso coffee maker. As steam first permeates the coffee bed, a surge of aroma results, but afterwards hardly any comes off.

From this and other similar experiments it is apparent that coffee solubles have very little flavor, while the volatiles have practically all of it. In addition, the steam distillates have flavorful organic homologous acids, phenolics, etc. The most abundant acid – acetic acid – represents about 0.3% of the roasted coffee weight.

There's further and stronger evidence that many of these volatiles, at parts per billion in the cup, have a very large influence on flavor. In fact there is reason to believe that the "lift" one gets from brewed coffee is not alone due to caffeine, but could very well be associated with the armoa essence constituents, many of which are considered toxic in large doses.

Working to Retain Volatiles

It is well known that in spray drying extracts, good natural coffee flavors are lost. But at the same time objectionable volatile hydrolysate tastes are lost too. These circumstances are responsible for two processing steps now under study:

1. Freeze concentration of the natural, flavorful extract to better retain its flavor through spray drying, and

2. Evaporating hydrolysates to remove foreign volatiles.

Freeze Concentration. Fortu-

MICHAEL SIVETZ

Technical Director, Cafe Soluble S.A. de Nicaragua, San Francisco

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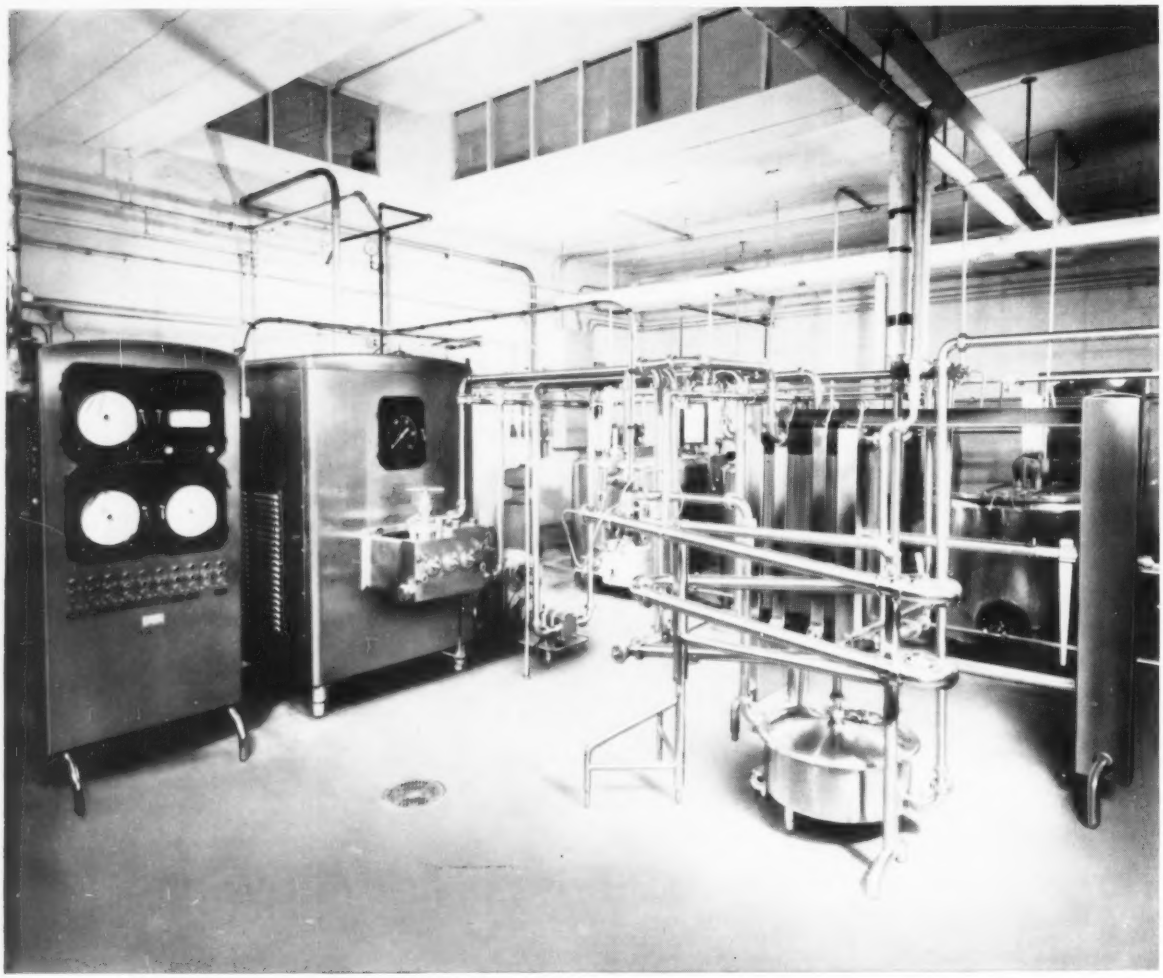

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nately, slow, continuous freezing of extracts (with centrifuging to remove water) tones down the acid-bitter hydrolysate flavor and can be practical in raising concentrations to 35-40% with subsequently less loss of natural flavor during spray drying.

Evaporating Hydrolysates. The EURDD in Philadelphia has demonstrated with fruit juices, that by flash-distilling 10% of the juice most of the important amora and flavor is recovered.

By applying this principle to coffee extraction (collecting the first 10% discharged from the percolator, then concentrating the remaining hydrolysate, followed by recombining and spray drying) bland tasting residues should result.

4 Aromatizing Approaches

There are numerous patented systems for "aromatizing" soluble coffee. These appear to fall in the following categories:

1. Extracting or expelling oils from coffee. Resulting product can be sprayed directly on the soluble powder.
2. Steam or vacuum distilling volatiles from the roasted ground coffee before percolation. The volatiles are recovered and added back to the percolated extract before drying.
3. Solvent extraction of the aqueous volatiles. This extract may be sprayed on the instant powder.
4. Combining the volatile essence and oil, then adding to the highly concentrated extract before spray drying.

The Coffee Oil methods are noteworthy because oil is a good absorber of organic volatiles, protects them from rapid oxidation, and markedly reduces their volatility. Also, oils are vital factors in the flavor of brewed coffee since they represent about 5% of the solubles, whereas percolated spray dried instant coffees have practically none.

Oils smooth the taste of the instant product, and "cut" the flavor stemming from the hydrolysis. Thus their virtues are considerable, especially when coupled with aroma essence. Of course, not all of the coffee essence is in the oil.

Solvent Extraction of the ground coffee has the merit of not producing an expeller cake, which is difficult to percolate. However, this method is selective and the resulting oil and essence does not give a balanced coffee flavor.

To achieve a genuinely turbid (oil-colloid) brew flavor, the essenced oil must be minutely dispersed in the water of the instant cup. Essenced oil homogenized in gum arabic achieves a brew flavor up to a point. But lack of certain polyphosphides results in a somewhat unnatural, bland flavor.

Silex brews are relatively clear—haven't much turbid colloidal oil. Therefore, the oil levels for aromatized coffees may not need to be as great as for conventional brewed coffee.

Steam Distillation. With the key flavor and armoa factors largely volatile, steam distilling the roasted ground coffee serves two purposes:

A. It quickly removes volatiles, allowing them to be condensed and cooled immediately.

B. It preheats and wets the freshly ground coffee which helps raise percolation temperature, thus facilitating rapid removal of the richest solubles.

The two steps together contribute to a much improved natural-flavored extract and powder.

Low Temperature Needed

Significant amounts of coffee aroma essence are contained in steamed or natural percolator-vented condensates from ice- or refrigerator-cooled condenser-traps. However, the balance of flavor volatiles is too minute and fugitive to be caught completely, except in properly designed dry-ice or liquid-nitrogen traps.

Early work with such low-temperature traps reported recovery of "kawfeol," which sounds like "coffee oil." Here, the investigators did not have tons of roasted coffee nor suitable traps for quantitative recovery of this tangible essence. But they proved that coffee aroma could be captured as a clear yellow-green, very voltatile and unstable liquid.

A number of aromatized products have been beneficially treated, but most are susceptible to rapid staling in air or slower staling in jars containing more than 1% oxygen.

The analytical resolution of coffee-aroma essence composition and judicious experiments in the plant and pilot plant to apply such knowledge will progressively evolve better flavored instant coffees for those who invest in such work intelligently.

In the meantime, simple techniques like steaming, recovery and replacement of volatiles, freeze concentration of extracts, and recovery of oil will continue to raise the quality of soluble coffee aroma and flavor. —*End*

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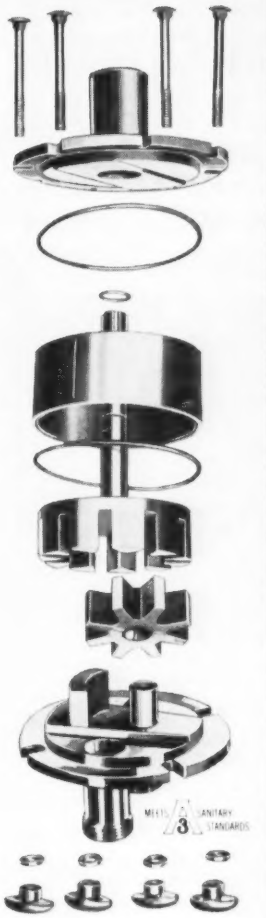

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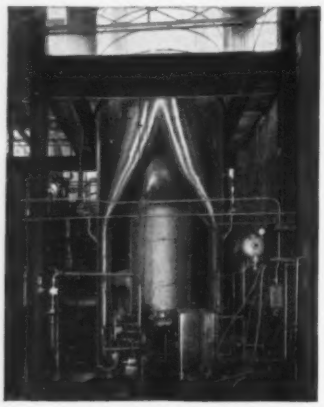

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Using a "spraying elevator", Vlasic Food Co., Detroit, has cut weekly washing time for its 128 trucks from 120 to 64 man-hours, and has cut costs 40%

BEGINNING its cycle, rectangular aluminum frame is lowered from ceiling on electrically powered and synchronized nylon cables. Completely encircling the truck, washer sprays combination of "shampoo" and rinse water through nozzles in frame. Action not only "scrubs" truck clean, but leaves a protective wax film (reported to make paint last 50% longer).

MIDWAY in 7-min. washing cycle, frame has made first complete wash of truck. Now it will automatically reverse and wash truck again on upward trip. Operator stands by pushbutton control, which finally raises frame back to ceiling, leaving washing area completely clear and unobstructed. Called Auto-Magic, units are made by Choldun Mfg. Corp., New Haven, Conn. Among other food companies that have adopted this efficient washer is Tasty Baking Co., Philadelphia (FE Feb. p. 40).

Mais Oui!

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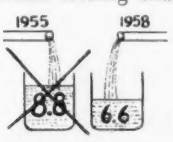
Tips From Newest Research

In rewarding factual sessions at AMI Research Conference, meat technologists point out that—

. . . **COSTS HOBBLE BYPRODUCT PROGRESS**—as in outlays involved in major applications for reducing grease protein losses in packinghouse wastes.

Seen as practical is modification of conventional waste-handling by: (1) Segregating (without screening) hasher-wash waters in primary settling basin for greater grease recovery, (2) recirculating settled effluent from secondary settling basins for re-use in hasher sprays to reduce hydraulic load 1¾-million gal. per day, (3) dewatering sludge (previously used for separating solids from hasher-washer) from primary basins over vibrating screen, and (4) recirculating screen underflow to primary basins for additional settling and grease skimming.



Comparisons between conventional waste-handling ('55) and modified ('58) showed these reductions: (1) Total wastes down from 8.8 to 6.6 mgd.; (2) liquid waste per 1,000-lb. kill from 35.5 to 7.6 lb.; (4) grease per 1,000-lb. kill from 27.2 to 7.6 lb.; and BOD (5-day biochemical oxygen demand) production per 1,000-lb. kill from 40.3 to 25.4 lb.—R. K. Steffa, The Rath Packing Co.

. . . **AGING OF BEEF IS SPED** very effectively by holding rounds infused with antibiotic solution (to control microbial growth) prior to slicing for 24 hr. at 110 F. Cited are tenderizing results similar to those with steaks aged two weeks at 35F. —G. D. Wilson, American Meat Institute Foundation.

. . . MEAT HYDRATION CAN BE A GOOD GAGE in quality control. For a simple press method judges suitability of meats for, say, wieners (that require specific water-holding capacity).

Such water capacity is influenced by grinding, method of adding water during grinding, net charge effect or steric changes (molecule groups modifying chemical activity) of protein molecule, and pre-salting of fresh meat just after slaughtering.

Measurement of pH influence (between 3.0 and 7.5) on water-holding gives data on effect of a process on protein's electrical charges and existence of steric effect.

Meat's normal divalent cations (calcium, magnesium, and zinc) reduce hydration. These metallic cross linkages can be eliminated to increase hydration in basic range of muscle's isoelectric point (electrically neutral). Trick is to employ cation exchangers, such as ATP (adenosinetriphosphate) or inorganic polyphosphates.—Reiner Hamm, Univ. of Ohio.

. . . A-RAYS CUT PROCESS TIME. Here, data indicated that minimum heat-treat period required for canned ground beef can be reduced at least 4-fold through applications of a 1.3 to 1.5 megarep dose of Cobalt-60 gamma rays.—L. L. Kempe, Univ. of Michigan.

. . . FREEZING IS BETTER UNDERSTOOD following new electron microscope and cinemicrograph studies of deep-chilled muscle-tissue. Tests show more rapid longitudinal than transverse formation of ice spears. This points to less shear stress, and consequently less tissue disruption. Too, there are more ice spears in fibers frozen at lower temperatures. And slow freezing causes more disruption of muscle tissue than quick freezing. —B. J. Luyet, American Foundation for Biological Research.

. . . PROTEIN FACTORS ARE NOW CLEARER. On a nutritional basis, beef, pork, and milk proteins are about 80% as effective as the reference protein, whole egg. Cereal proteins are about 30% as effective. Supplementing cereal proteins with synthetic amino acids raises their protein-efficiency ratio to values approaching those of meat and dairy proteins.—E. T. Mertz, Purdue Univ.

—*FE Staff*

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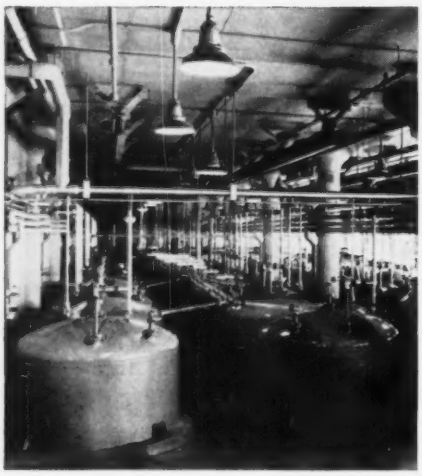
and the experience
for solving problems involving fluids



FLUIDICS covers such varied phases of fluid handling and control as

blending
evaporation
distillation
drying
filling
heat transfer
storing
centrifuging
agitation
water treatment
corrosioneering
waste treatment
metering

Whenever you have a fluid-handling problem, look to this Pfaudler Permutit FLUIDICS program for the best solution.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS . . .
the science of fluid processes

FLUIDICS AT WORK

How Glasteel protects delicate flavors

This room is the resting place of various whiskeys and wines before they go into bottles under the stern eye of the Ontario Liquor Control Board. The equipment used can have a critical effect on the flavor of the whiskeys and wines.

Metals can change a product's flavor. Glass cannot. Glass is inert. That's why the forty tanks in this room are Pfaudler Glasteel (glass inside, steel outside).

Absolute cleanliness is a must in this equipment. When a tank goes from holding whiskey to holding wine, for example, there must be no residue left from the first batch to affect the flavor or make-up of the second.

Practically nothing clings to glass. What does cling washes away easily. That's another reason why all forty tanks in this room are Pfaudler Glasteel.

That's our story on all food storage. You want a tank with no flavor of its own. You want a tank that cleans easily. Just one material does both economically and consistently—Pfaudler Glasteel.

All the details you might want to know are in Bulletin No. 968, which is yours for the asking. Write to our Pfaudler Division, Dept. FE-59, Rochester 3, New York.

a good team for steam

This Yarway team has scored high—over a million installed on all types of steam equipment. Stocked and sold by 270 Industrial Distributors. For free Steam Trap Book, write YARNALL-WARING CO., 127 Mermaid Ave., Philadelphia 18, Pa.

go YARWAY with confidence

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Circle 303 on Reader Service Card

Better Malt With Gibberellinic

Improving malt quality by the use of gibberellinic acid seems quite promising, as the result of experiments carried out at the pilot plant of Stockholm Brewery.

In experiments on Beka, Ingrid, and Herta barleys, application of 2 or 3 mg. gibberellinic acid per kg. after a preliminary steeping, increased extract yield, modification (measured by Kolbach number), diastatic power, alphaamylase, proteinase, and cellulase in the malt.

Mashes made with malt produced from the treated barley fermented normally. Yeast does not seem to be affected by acid and up to 0.8 mg. of it per l. of wort had no effect on production of CO_2.—*Wissenschaftliche Beilage* 11(12), 231-38, 1958.

Wide-Range Plastic Spread

An anhydrous spread that unlike butter or margarine has a wide plastic range, has been made from Canadian oils.

Most satisfactory formula comprised: 38.4 lb. deodorized, hydrogenated beef tallow (IV-28.6); 158 lb. acetoglyceride prepared from hydrogenated soybean oil (IV-52.0); 0.5 lb. fluidized lecithin; 2.5 lb. pulverized pure salt, *B*-carotene, commercial antioxidant, and flavor. Fats were deodorized separately, then all ingredients were blended at 120F. and pumped to a Votator where N_2 was incorporated. Solid product was canned in N_2 and tempered at 70F. for 48 hr.

Consistency of product was excellent, and spreadability good at temperatures from −10 to +100F. There was no noticeable deterioration after 165 hr. at 210F.—*J. Amer. Oil Ch. Soc.*, 45-49, Feb. 1959.

Dehydrocanning of Apples

Partially dehydrating apples pieces without addition of a sulfiting agent, then canning and heat sterilizing them are objects of a recent patent.

In the process, pieces of raw apples are first treated with an aqueous solution of salt and fruit acid such as citric, tartaric or malic. Then they are dried to 35-70% moisture content, canned and sterilized in the container.—U. S. Patent 2,874,059, Feb. 17, 1959.

Instrument Checks Maturity of Fruit

An intriguing mechanical prodigy that can determine maturity of fruit without damaging the sample has been developed by the Agricultural Marketing Service, USDA.

Basis of the unit, called Hortispect, is measurement of wavelength of light transmitted through the sample.

In practice, it indicates color of light that is most easily transmitted. For example, green light will pass through green fruit better than any other color; yellow goes through yellow fruit most easily, and red light through red fruit.

Whole fruit is placed over light source of the instrument. A light-tight seal is made at base of fruit and an integrating sphere lowered so fruit is completely enclosed.

At press of a switch, scanning process starts, and different wavelengths of light are transmitted through the fruit. When maximum wavelength is reached, switch is released. Reading on wavelength dial at this time is index of maturity.

Light source is a 6v., 100w. ribbon filament lamp. This filament provides a narrow beam of energy which is focused on test sample through standard microscope lenses.

Heart of unit is a small piece of glass ¾x3x⅛ in. thick known as a wedge interference filter. When held up to the light, all colors in the spectrum can be seen. In the Hortispect, filter is moved through light beam so sample is illuminated first with blue light, then green, etc.

When phototube, which measured the transmitted light shows a maximum, position of filter at that moment indicates peak wavelength.

Movement of filter is controlled by switches. A meter shows level of light transmitted through sample and provides a convenient check on instrument's operation.—*Agricultural Marketing* (USDA, Washington 25).

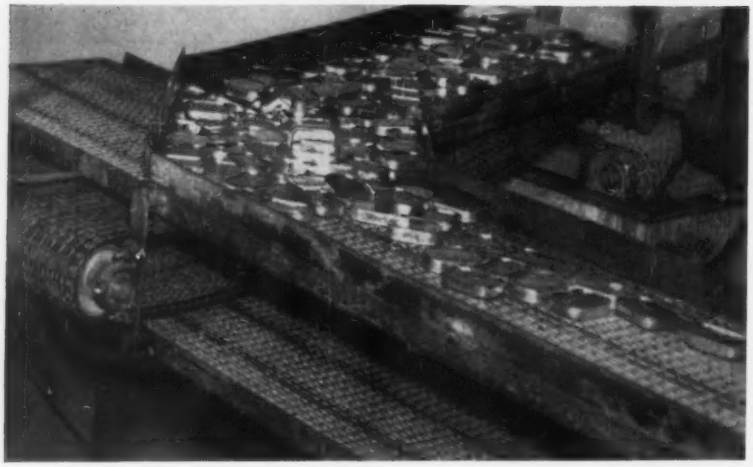
Dehydrated Tomato Juice

Expansion during drying and maintenance of this state are particular objectives of a patented process for dehydrating tomato juice.

Resulting product is in form of

The big PLUS in Oakite

SERVICE + EXPERIENCE
RESEARCH + PERFORMANCE



End-of-season protection cuts next year's start-up costs

POST-SEASON CLEAN-UP and protective action shows up as a big economy the following season. For example:

Outdoor conveyor chain at one cannery carried containers from railroad cars to interior storage area. Each year the conveyor was torn down, stored, then reassembled at start of the new packing season . . . at a cost of $200. Now, Oakite STEEL PRESERVER is applied to the line in place at season's end. It keeps the conveyor rust-free through the Winter . . . strips off with Oakite detergents, leaving the conveyor ready for instant action at Spring start-up.

Inside plants too, Oakite materials protect equipment during seasonal shut-downs. Recommended procedure: thorough cleaning with specialized Oakite materials; then spraying with Oakite SPECIAL PROTECTIVE OIL, which provides between-season protection against indoor rust. Use STEEL PRESERVER where excessive moisture is expected. In either case, getting equipment back into production shape next season will take fewer man-hours—and cost less.

The big PLUS in Oakite

Working with the Oakite man is like adding a consulting cleaning engineer to your staff. He brings with him the results of latest sanitation research . . . information on modern cleaning methods . . . the vast experience of the Oakite organization . . . time—and money-saving equipment . . . materials *guaranteed* to do the job. Ask him for proof. Or, write for Bulletin F-9414. Oakite Products, Inc., 27A Rector Street, New York 6, N. Y.

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SCIENCE
in our 50th year

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Advances in Technology

free-flowing crystalline granular particles that show a high rate of rehydration. When reconstituted, juice has the same taste, vitamin content, and other nutritive values as freshly prepared juice, and the solids will not separate from the liquid.

Essential to the expansion are certain chemical and physical properties of original tomato material which, in turn, are dependent on the manner in which the latter is prepared. Preferably, raw tomatoes are sliced and immediately heated to a temperature of 180-200F. before any chemical modification of the natural pectin can occur.

Furthermore, at this temperature enzymes will be inactivated and tissue will become dissociated into individual unruptured cells. Juice produced by this treatment is screened to remove seeds and other undesirable material, then subjected to the puff-drying procedure.

First step is concentration under vacuum at about 100F. to a density of 35-80 deg. Brix. Concentrate is gassified by incorporating air or other inert gas to enhance the expansion effect during drying. For this final operation vacuum tray driers may be used under a vacuum of less than 10 mm. Hg.

No heat is used in the initial stage, during which the material will expand up to 20 times its original volume. Cooling effect of evaporation causes product to assume a stiff plastic condition that retains its expanded form. Heat is then applied at two successive temperature levels until moisture content is down to about 5%. Trays are then cooled, the material removed, broken into crystalline flakes, and packaged in air-tight cans.—U.S. Patent 2,958,-226, Oct. 28, 1958.

Packaged Foods Helped By Vacuum Fumigation

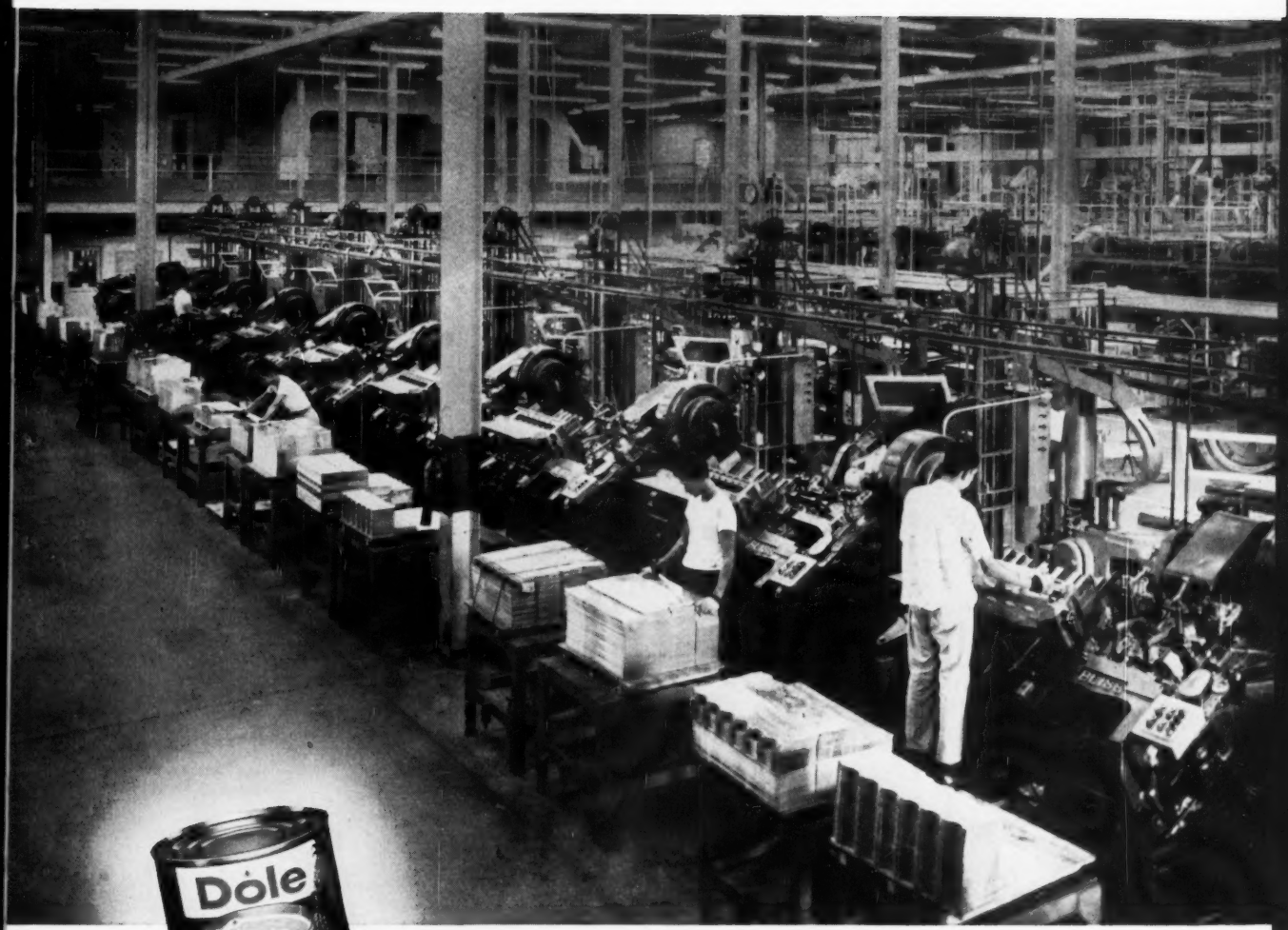
In reduced pressure fumigation, it is necessary to know the effect of the reduced pressure on the sorption equilibrium between fumigant and commodity.

Thus the sorption of HCN by wheat feed at a constant concentration of 10 mg./l. was essentially identical, both at atmospheric pressure and at 5 cm. Hg in the fumigating chamber.

With methyl bromide, however, the sorption was greater at one atmosphere than at 5 cm. With whole

For more data, circle 304 on Reader Service Card

For more data, circle 305 on Reader Service Card



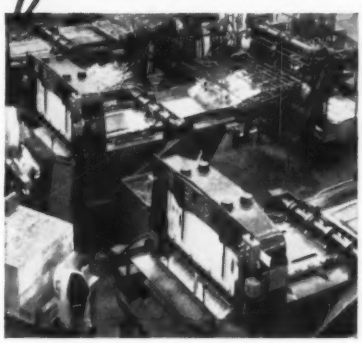
PINEAPPLE...

with a touch of BLISS

When Dole began to make its own cans, they made about 400,000,000 of them in eleven different sizes in their first year and effected some extremely impressive savings as a result.

One of the reasons is the fact that all of their end-making equipment is Bliss, including these high speed steady-performing strip feed presses.

How much would you save by making your own cans? One way to find out is to ask Bliss. Whether you need a single machine... a bank of related machines... or a complete "turn-key" plant... it'll make sense to check Bliss.



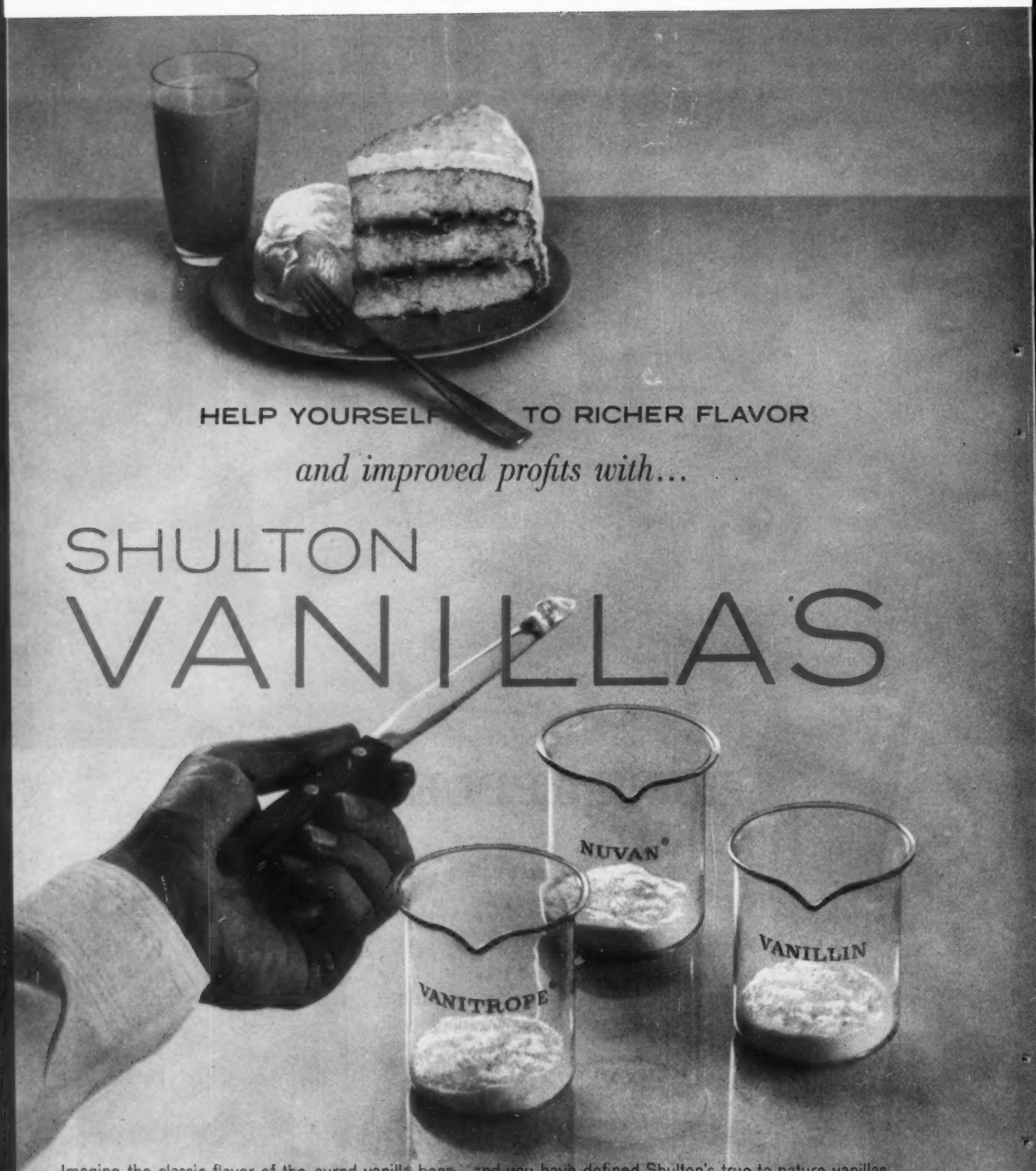
Scrolled Strips for Strip Feed Presses are produced on five Bliss Scroll Shears.

BLISS
SINCE 1857

E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name—it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CAN MACHINERY • CONTRACT MFG.



Imagine the classic flavor of the cured vanilla bean... and you have defined Shulton's true-to-nature vanillas. Shulton's VANILLIN USP is a standard for quality and blendability. VANITROPE® (up to 25 times stronger than Vanillin) also enhances flavors, gives you greatest economy. Now available are versatile NUVANs®... blends of Vanillin and Vanitrope... so adaptable for quality vanilla effects, and even more economical than Vanillin. Whether it's chocolate—cookies—ice cream—cakes...you can make it better with Shulton vanillas. And save up to 50% or more in flavoring costs. Why not write for information and samples today?

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Making good products better—through research

Advances in Technology

wheat the sorption of CH_3Br was greater at reduced pressure.

When commercial packages are fumigated, reduced pressure may thus result in an increased rate of penetration, as well as making possible a reduction in the dose of fumigant required, by reason of better distribution throughout the package. A lower dose could also mean a lower residual bromide level throughout the package.—*J. Sc. Food & Agr.*, 10 (2), 93-100, 1959.

Heating, Moistening Flour Improves Baking Quality

A German process and equipment for improving the baking quality of wheat flour is the subject of a recent patent.

In the process, flour is fed at a uniform rate into a high-velocity stream of air where it is quickly heated mechanically to 105-115F. and, simultaneously, moistened.

Then superheated steam at 95% RH is injected into the conveying path to bring flour temperature to 177-195F.

Next step comprises separating flour from air stream and quickly cooling it to room temperature.—U. S. Patent 2,880,093, Mar. 31, 1959.

Special Media For Detecting *Salmonella* in Food Products

Isolation and correct enumeration of *Salmonella* bacteria in foods may not be entirely satisfactory with the usual media and counting procedures.

Since the foods have usually been processed by heat, freezing, desiccation, curing agents, and extremes of pH and osmotic pressure, the organisms have been subjected to drastic and abnormal environments.

The method of choice for their detection and isolation is a combination of cysteine selenite F enrichment broth and subsequent streaking on brilliant green agar.

In experiments on isolation of *Salmonella* from egg products, selenite brilliant green broth of Stokes and Osborne, and selenite brilliant green sulfapyridine broth of Osborne and Stokes were found superior to selenite F broth.

On 21 samples of egg white solids, average counts for the 3 media were 7.67, 17.25, and 0.44 per g. respectively.—*Applied Microbiology*, 6(3), 189-93, 198-201, 1958.

MAIL THIS COUPON

Cyclone Fence, American Steel & Wire
Dept. H59, 614 Superior Avenue, N.W.
Cleveland 13, Ohio

Please have your trained representative call on us to discuss our production problems.

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To Whom money May Concern:

If your production costs are higher than they ought to be, you very likely can do something about it. Often one change in a method or process can make the difference between loss and profit. We'd like a chance to consult with you and see if such a change in method won't improve *your* profit picture. (It certainly has paid off for many other firms). The best part is, that it won't cost you one cent to find out. Just clip the attached coupon and mail it. When you do, one of our trained conveyor belt representatives will visit you to discuss and examine your particular problem and offer suggestions that will show you how Cyclone Metal Processing Belts may cut your production costs below the ulcer level. These suggestions will be tailored to YOUR problem . . . and no obligation. How can you lose? Do it, today. *USS and Cyclone are registered trademarks*

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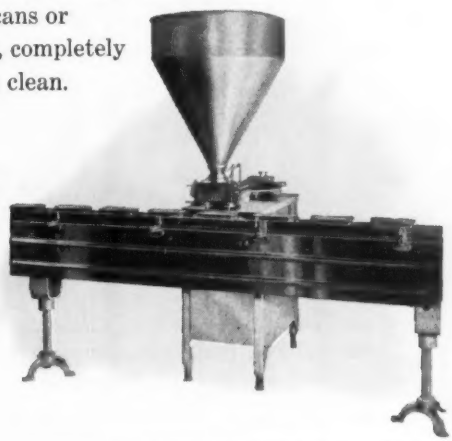
For inexpensive filling . . .

the **SIMPLEX** TWIN

Top efficiency with this fully automatic Simplex Model T. A universal machine to handle cartons, cans or jars. No can no fill, completely adjustable, easy to clean.



Fills 25 to 80 containers per minute! Range from 2 oz to a gallon! Handles liquids and semi-solids!

Write for circular on this 2-piston model and other Simplex fillers. Dept. FE.

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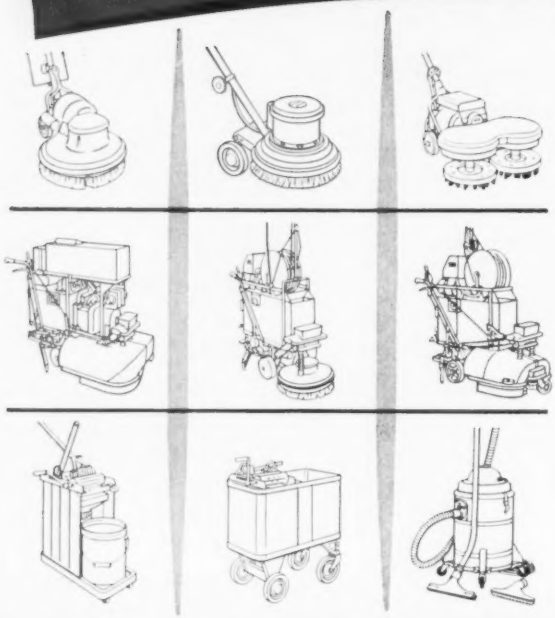
Keep your floor-maintenance men happy . . .

with *Job-Fitted* EQUIPMENT!

Choose from the COMPLETE *Finnell* Line

More than a score of models and sizes permits selection of the equipment that's exactly right for your job!



However much a maintenance man may want to do a good job, and at the same time show savings in labor costs, he's *stymied* if the machine is too small, or too large, or is otherwise unsuited to the job. Different floors and areas call for different care and equipment. That's why *Finnell makes more than a score of floor-maintenance machines.* From this complete line, it is possible to choose equipment that is correct in size as well as model . . . that provides the maximum brush coverage consistent with the area and arrangement of the floors.

Finnell offers *Conventional Polishing-Scrubbing Machines* in both concentrated and divided-weight types, each in a full range of sizes . . . a *Dry-Scrubber,* with self-sharpening brushes, for cleaning grease-caked floors . . . *Combination Scrubber-Vac Machines* for small, vast, and intermediate operations, including self-powered as well as electric models . . . *Mop Trucks* . . . a *Wet and Dry Vacuum Cleaner,* in baked enamel or stainless steel, with 1½ hp By-Pass Motor. In addition, *Finnell* offers a full line of fast-acting *Cleansers* for machine-scrubbing . . . *Sealers* and *Waxes* of every requisite type . *Steel-Wool Pads* and other accessories — *everything for floor care!*

In keeping with the *Finnell* policy of rendering an individualized service, *Finnell maintains a nation-wide staff of floor specialists and engineers. There's a Finnell man near you* to help solve your particular floor-maintenance problems . . . to train your operators in the proper use of *Finnell Job-Fitted Equipment and Supplies* . . . and to make periodic check-ups. For consultation, demonstration, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 5705 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

FINNELL SYSTEM, INC.

Originators of Power Scrubbing and Polishing Machines

Everything FINNELL for Floor Care

BRANCHES IN ALL PRINCIPAL CITIES

ANNOUNCING

THE NEW WRIGHT

Advanced Bagmaster®

This new, 100% automatic system forms, fills, and seals pillow-type packages. Its many advanced, superior features permit the gentle and precisely accurate weighing and packaging of even such fragile and multi-dimensional products as potato chips.

NEW DESIGN: Only 7 feet high, including weigher.

NEW WEIGHING ACCURACY: Our new Hytronic net device is an integral part of the system, not just an auxiliary.

NEW ECONOMY: Material stock rolls can be reloaded without stopping processing line.

NEW FLEXIBILITY: Produces pillow type packages, single or double wall, printed and unprinted, up to 8 inches wide and 14 inches long, of a variety of dry, free-flowing products.

WRIGHT MACHINERY COMPANY
DIVISION OF SPERRY RAND CORPORATION
DURHAM, NORTH CAROLINA

WRIGHT Machinery Company Division of Sperry Rand Corporation (FE)
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Send me details on your new Advanced Bagmaster System.

NAME & TITLE: _____

COMPANY & ADDRESS: _____

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PRODUCTS: _____

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Using Salt Efficiently

by INTERNATIONAL SALT COMPANY, INC.

"Why we use Sterling Purified Salt in the pre-sterilized juice process"

Quality tomato juice is the specialty of the Francis C. Stokes Company in Vincentown, New Jersey. They pack Stokes and private-label brands for several large grocery chains and leading independents. Present plant was rebuilt in 1955 and has the latest canning equipment, maintained spotlessly clean and sanitary.

Sterling Purified Salt is dispensed through the Sterling Bulk Salt Dispenser on a line averaging 180 cans per minute. 150 grains are deposited in each #46 can. The accuracy of the salter and the free-flowing quality of the salt make this high-speed operation possible.

"The main reason is that it flows freely from our dispensers," writes Francis C. Stokes, Jr., V. P., Francis C. Stokes Company.

"Ever since we changed to Sterling Purified Salt, we've had far less trouble with the dispensers clogging. This salt flows better than any of the others we tried in the past—and that's quite remarkable considering the very humid conditions encountered in a juice-canning plant.

"Here's another point. In our process, the juice is sterilized before it reaches the canning machines. In our four years of using and testing Sterling Purified Salt, we've never come across a batch that didn't meet our sanitation requirements!"

Guaranteed more than 99.95% pure, Sterling Purified Salt never has more than 40 parts per million combined calcium and magnesium, never more than 0.5 parts per million copper or iron. That's why Sterling Purified Salt more than meets the low requirements for calcium, magnesium, copper and iron for the entire food-processing industry . . . and why it *always* protects the flavor, color and texture of canned foods.

3 high-speed dispensers for Sterling Purified Salt. You can dispense Sterling Purified Salt any way you want—in brine, tablets or bulk—with one of the three special dispensers available from International Salt Co. Whatever dispenser you choose, you're sure of greatest accuracy and dependability at high line speeds.

The new Sterling Brinomat dispenses Sterling Purified Salt *brine* into as many as 300 cans per minute. The well-known Sterling Saltomat deposits Sterling Purified Salt *tablets* from 10- to 250-grain size. And the dependable Sterling Bulk Salt Dispenser is used to dispense *bulk* Sterling Purified Salt.

If you'd like more information on these modern salt dispensers, including a guaranteed analysis of Sterling Purified Salt, phone our nearest sales office, or write to us direct.

International Salt Company, Inc., Scranton 2, Pa. • Sales Offices:

Atlanta, Ga.	Chicago, Ill.	Memphis, Tenn.	Philadelphia, Pa.
Baltimore, Md.	Cincinnati, O.	Newark, N. J.	Pittsburgh, Pa.
Boston, Mass.	Cleveland, O.	New Orleans, La.	Richmond, Va.
Buffalo, N. Y.	Detroit, Mich.	New York, N. Y.	St. Louis, Mo.

Service and research are the extras in

STERLING SALT

INTERNATIONAL SALT COMPANY, INC.

Dr. Roy C. Newton

Research Leader . . . Swift & Co's distinguished research v.-p., Dr. Roy C. Newton, has retired after 35 yr. with firm.

He is noted for his personal research, especially in area of edible fats and oil. But his career has emphasized encouragement of team talent. He helped build a staff that has contributed hundreds of improved food products (see FE Aug. '57, p. 55.). And for "outstanding leadership in organization of industrial research," he won award of Industrial Research Institute.

The long list of Dr. Newton's achievements includes past presidency of Institute of Food Technologists, and receipt of Nicholas Appert Award.

He is succeeded by Dr. H. E. Robinson, formerly Swift's director of laboratories, and also a former IFT president.

Roger F. Hepenstal

'Tin Can' Sesquicentennial . . . "Food processors buy over 50% of all cans produced, and brewers another 20%."

Breakdown comes in Roger F. Hepenstal's invitation to "principal users" to join metal can business in celebration of its 150th birthday in 1960.

As Can Mfrs. Institute's newly-elected prexy, he reports '58 total production of 42 billion cans.

"But 'tin can' is a misnomer," says he. "Of millions of tons of metal going into them, only .4 to 2% is really tin. And millions of them contain no tin at all."

Robert F. Blume has become national merchandising director for Stokely-Van Camp, Inc.'s frozen food div., Oakland, Calif. Post is newly created and marks firm's stepped-up expansion of division.

John M. Fox, Minute Maid Corp.'s prexy, has become v.-p. of Council for International Progress in Management (USA), Inc.

Theodore R. Gamble, 34, exec. v.-p. and grandson of the founder, has become president of Pet Milk Co. Former prexy **Robert L. Latzer** steps up to board chairman. New v.-p.'s are **Gordon Ellis** and **Lester G. Leutwiler.**

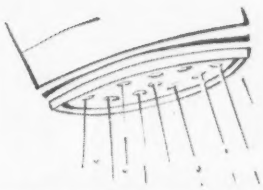
Dr. Charles H. Hendershott, Jr., Arkansas scientist, has been selected by Florida Citrus Commission to direct project for artificially freezing citrus trees.

John Holmes, board chairman of Swift & Co., has retired, after 52 yr. with firm.

Parlin Lillard will fill newly-created post of v.-p. of packaging and special projects at General Foods Corp.

Paul V. Rea, exec. v.-p. of U. S. Products Corp., Ltd., San Jose, Calif., has been elected president of Canners League of Calif.

H. Gordon Snowcroft will fill United Fruit Co.'s newly created post of marketing v.-p. He has been director of marketing development for Campbell Soup Co.



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SIFTER TOPS
make
Dollars and Sense

In the shifting sands of spice sales, WS SIFTER TOPS are taking a strong stand.

Women like them.
Men like them.
Everyone likes the convenience they add to your package.
YOU'LL like what they do to your sales.

WS SIFTERS are easy to apply—just snap on. They do double duty—no cap liner is necessary.

IF YOUR PRODUCT IS SIFTABLE GET FULL INFORMATION ON WS SIFTER TOPS
Ask your WS salesman, write, or call collect—Warwood 1540

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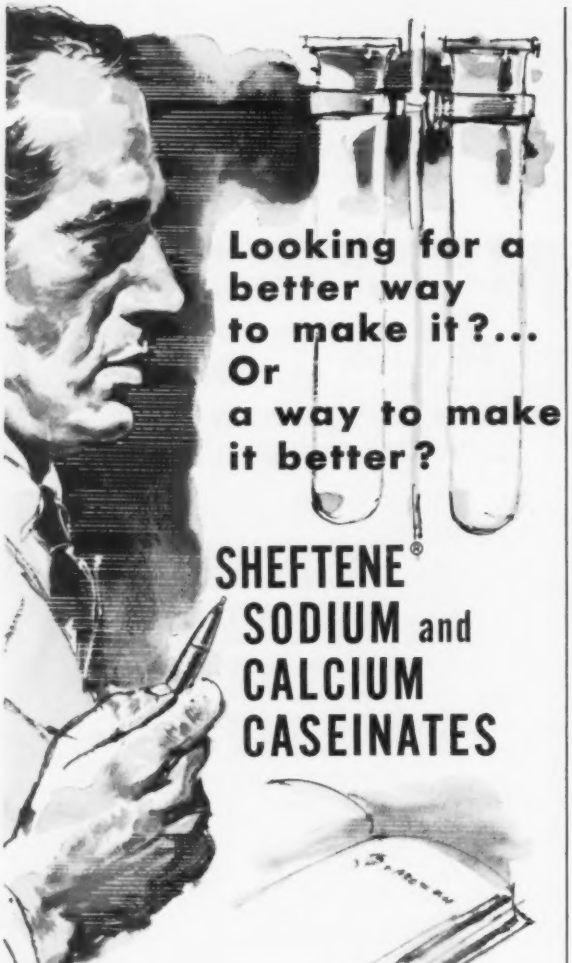


Whatever kind of food you produce, chances are Sheftenes can help you upgrade the quality of your product or even improve its manufacturing process ... Or both!

Primarily Sheftenes are known as a high-quality protein supplement, rich in lysine and other essential amino acids. But they offer a wide assortment of functional advantages as well.

Here's just a partial list:

Bakery: As a high-protein ingredient for bread.

As a volume controllant to insure proper texture and uniformity of doughnuts, cookies and waffles.

As a fat-blocking ingredient to prevent excessive absorption of fat in frying of doughnuts.

Dairy: As a stabilizer and emulsifier in milk shake bases. As a low-calorie stabilizer in ice cream for diabetics.

As an agent to assure the keeping quality of ice cream.

Cereals: As a supplement to improve the "amino profile" of grain cereal products.

Infant Foods: As a high-quality, high-protein supplement in infant and special dietetic products.

For samples and technical data write Dept. FE-59.

SHEFFIELD CHEMICAL
Norwich, N.Y.
A DIVISION OF NATIONAL DAIRY PRODUCTS CORPORATION
Western U.S. distribution through
BRAUN-KNECHT-HEIMANN CO., and Affiliates — San Francisco

Selling Challenge . . . Quaker Oats Co. has souped up its marketing team to meet "sharpening" competition.

Heading tightened-up sales, advertising, and merchandising activities is Marketing V.-P. William G. Mason. Since '51, he has been cereal sales v.-p.

Emphasis will be on "consumer promotion and strengthening of services to grocers."

Says President Donold B. Lourie: "The pattern of food distribution has been revolutionized. Today's manufacturer must provide a unique variety of promotional services to maintain his brands and build acceptance of new products."

William G. Mason

Industry

Campbell Soup Co. has announced its '59 aid-to-education program, totaling about $424,000.

International Dairy Supply Co., subsidiary of Foremost Dairies, Inc., has been awarded a long-term contract, amounting to $10 million a year, to supply recombined milk and other dairy products to U. S. Armed Forces in Japan, Guam, and Okinawa.

Hills Bros. Coffee, Inc., San Francisco, will more than double capacity of its instant coffee manufacturing facilities with installation of new equipment.

P. J. Ritter Co., Bridgeport, N. J., and **Brooks Foods, Inc.**, Collinsville, Ill., jointly announce their merger.

Royal Crown Cola Co. is new corporate name of **Nehi Corp.** President W. H. Glenn says change reflects increasing sales importance of company's spearhead brand, Royal Crown Cola.

Shedd-Bartush Foods, Inc., stockholders have approved merger of the Detroit firm with **Beatrice Foods**, Chicago, on stock exchange basis. Cash equivalent of cost of transaction to Beatrice Foods is about $10 million. Fiscal '58 sales of Shedd-Bartush were $42.7 million, while BF reported $353 million.

Suchard Chocolate, Inc., Lancaster, Pa., has been organized to market consumer products of the parent Switzerland firm. Activity has been taken over from **Wilbur Chocolate Co.** (formerly Wilbur-Suchard Chocolate Co.), Lititz, Pa. Latter firm now concentrates on supplying chocolate coatings, liquors, powders, and flavorings to food processors.

Associated Industries

Bastian Blessing Co.'s V.-P. Larry N. Lucas recently received Dairy Industries Supply Assn.'s Honor Plaque for outstanding service.

Foundation for Instrumentation Education & Research will award six new fellowships in name of industrial donors, among whom are: **Daystrom Incorporated, Foxboro Co., Leeds & Northrup Co., Minneapolis-Honeywell Regulator Co.**, and **Panellit Corp.**

National Starch & Chemical Corp. is new name of **National Starch Products, Inc.**

Deaths

Duncan Hines, 78, food authority, co-founder of Hines-Parks Foods (merged with Procter & Gamble Co. in 1956).

Lee Kenyon, 56, president, Preservaline Mfg. Co.

Dr. Nandor Porges, 57, USDA microbiologist, widely known for developing process for disposal of dairy wastes.

Gustav F. Siemers, 63, technical director of Vitamin Div. of Hoffmann-La Roche Inc., Nutley, N. J.

Alfred N. Steele, 57, board chairman & chief exec. officer, Pepsi-Cola Co.

For more data, circle 313 on Reader Service Card

For more data, circle 314 on Reader Service Card →

"15% sales increase due largely to Knox-designed jar," says president of leading gourmet foods firm

The handsome fluted glass packages shown above were designed by Knox Glass, Inc. in 1957 for a leading Eastern manufacturer of gourmet foods.*

According to the firm's president:

"Sales increased nearly 15% after changing to the fluted jar which Knox Glass designed exclusively for us.

"The eye-catching salesmanship of the jar, which has no label other than the closure, permits the purchaser a clear, clean view of our appetizing products, such as Potato Salad, Cole Slaw, Macaroni Salad and Vegetable Chow Chow. Knox's strong design and the excellent quality of the glass we buy from Knox, combine to make this a wonderful package.

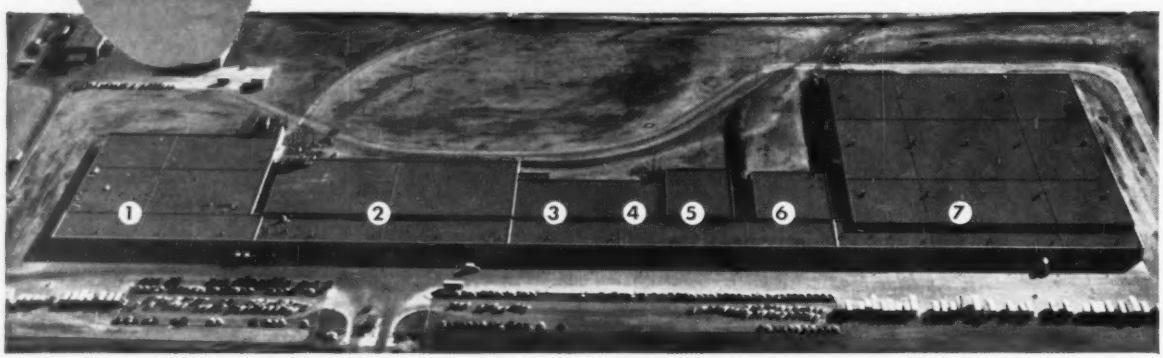
"We've been a Knox customer for nearly seven years and buy almost exclusively from them. Special quality products such as ours demand high quality glass and exceptional service. This we get from Knox."

Find out more about how Knox can meet your glass container needs — contact Knox Glass, Inc., Knox, Pennsylvania.

*Name available on request.

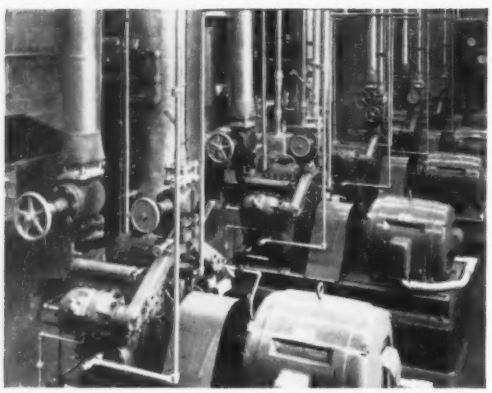
the new/**KNOX GLASS**

Look Inside this huge Safeway warehouse...



1. Meat 2. Produce 3. Mixed Loads 4. Baked Goods 5. Frozen Foods 6. Milk Products 7. Groceries

Discover How 4½ Acres of Food Are Quality Protected by YORK Refrigeration



York V/W Compressors, as installed here at Safeway, are adaptable either as booster or high stage machines. York's built in capacity reduction feature gears power loads almost directly to product loads. At 25% product load, for example, the compressor requires only 28% power. And for low maintenance—every part subject to wear can be replaced easily with ordinary hand tools.

For assured performance and protection, the Safeway Stores Warehouse in Denver really put its faith in York Refrigeration Equipment. Here—in a warehouse 1790 feet long with 13½ acres of floor area—York equipment delivers over 528 tons of capacity for the 200,000 square feet under refrigeration.

In the seven refrigerated product sections, eighteen York V/W type compressors produce temperatures ranging from minus 20° F to plus 52° F. The compressors contain a total of 120 cylinders and are operated by motors having a combined capacity of 900 horse power.

Over 50 York Air Conditioners of varying types are used in the various sections for proper distribution and maintenance of temperatures. Other York equipment includes condensers, receivers, oil separators, inter-coolers, suction traps, water cooling towers, etc.

For proof of flexibility—a recent situation called for one room at 67° F. for bananas, three other rooms at 42-46° F., and the remaining four at design conditions.

For more information about flexible, dependable, York V/W compressors and their application to a wide variety of refrigeration needs, write the York Corporation, York, Pennsylvania.

YORK

YORK CORP. SUBSIDIARY OF BORG-WARNER CORP.
2885 SOUTH GRANTLEY ROAD, YORK, PA.

BORG-WARNER
RESEARCH & ENGINEERING
MAKE IT BETTER

Air Conditioning, Heating, Refrigeration and Ice-Making Equipment • Products for Home, Commercial and Industrial Installations

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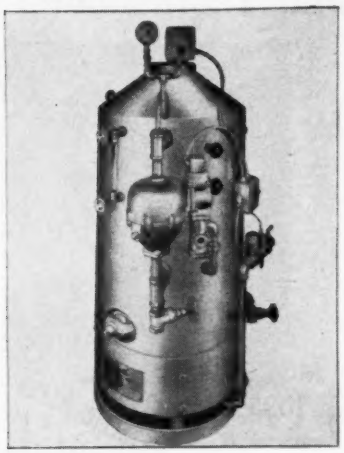
NEW EQUIPMENT & SUPPLIES



Compact Steam Supplier

Here is a new vertical, low-pressure ASME boiler for supplying low-cost steam to food-plant units, such as bakery ovens and proof boxes, dairy pasteurizers, jacketed kettles.

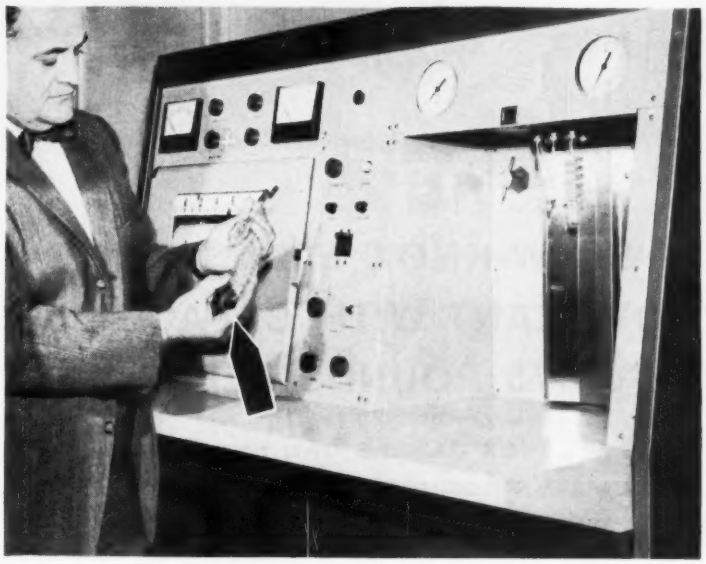
Three models are offered—2, 4, and 6-hp. capacities. Latter requires only 30x32-in. area. Gas-operated, the units deliver steam at pressures ranging to 15 lb. Features include: Automatic water feed and low-water cutoff, pressure control, safety pilostat, safety valve, gas solenoid and manual electric switch.—*Anetsberger Bros., Inc., 180 N. Anets Dr., Northbrook, Ill.*

Circle 16 on Reader Service Card

Markets Special Extruder

Newly offered is a machine for automatically and continuously extruding quantities of semi-solid foods, as baker's dough and meat products.

Capacities of unit range between 600 and 3,800 lb./hr., depending on material run. Different nozzles may be employed to produce round, square, or oblong shapes.—*Crissey Co., 200 W. 54th St., K. C. 12, Mo.*



Each lift-off trap collects a specific component (arrow).

Gas Chromatograph for Multi, High-Purity Separations

Preparation of ultra-pure components of flavors, aromas, and other materials — in volumes 100 times larger than possible with existing chromatographs, an at no sacrifice in resolution—is reported with use of this new gas unit, the Megachrom.

Accenting instrument's exceptional column capacity is the fact it will take samples as large as 20 milliliters. Self-contained in a single cabinet (photo), unit includes an automatic sample-collection system, recording readout, re-cycling pump, and clean-out traps for extending life of carrier gas. Temperature, pressure, and carrier-gas controls and indicators are grouped on front panel.

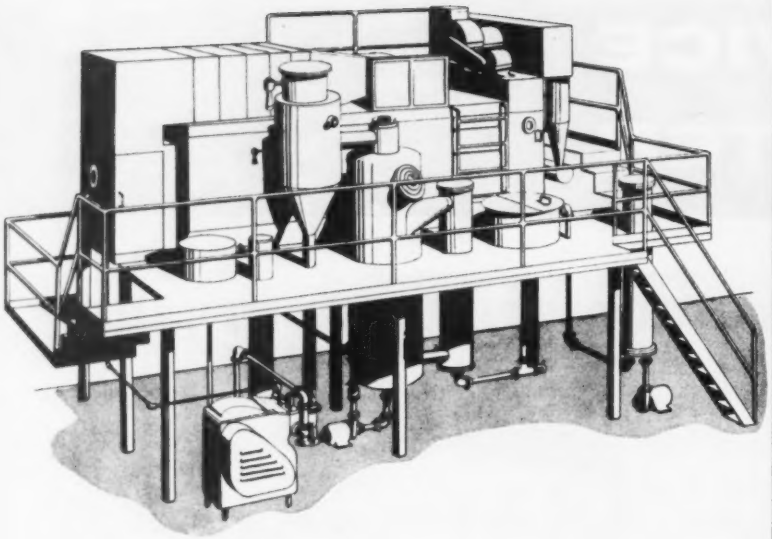
Units use slender 6-ft.-long metal tubes packed with specially coated granules of a firebrick-like material. A sample, once injected, is picked up in a stream of inert gas and carried through. According to its affinity for the coating, each component is delayed a different length of time in transit, hence emerges at a different time. At discharge, components are in a highly purified form.

Sample collection is via a valve with four trap positions and four alternated bypass positions. Valve can be operated manually or automatically. System permits separation of a number of consecutive components.—*Beckman Instruments, Inc., 2500 Fullerton Rd., Fullerton, Calif.*

Circle 17 on Reader Service Card

New 'All-Around' Lift-Truck

Versatile new lift-truck, called ideal for operation in tight quarters, is the FTP 20-24. It's a pneumatic-tired 2,000-lb.-capacity unit powered by a 4-cyl. heavy duty industrial en-



The BLAW-KNOX MILK DRYING PILOT PLANT WITH CAPACITIES UP TO 175 POUNDS PER HOUR

NOW LARGE DAIRIES CAN RESEARCH SPECIALTY PRODUCTS . . . SMALL DAIRIES CAN SOLVE SEASONAL SURPLUS PROBLEMS

All in one "package" the evaporator and spray dryer are shipped to you complete with milk pre-heater, storage tank, high concentrate heater, surge tank, high pressure pump, sifter and all inter-connecting sanitary piping. Easy reassembly eliminates field welding. Fitted at factory, shipped to you ready for steam, water and electrical connections. Built to Sanitary Dairy 3-A standards, the "Pilot Plant Package" will handle all types of dairy products, non-fat milk, whole milk, whey, buttermilk, dietetic foods and others. Ask for Bulletin 590 for more details and specifications.

BLAW-KNOX

BLAW-KNOX COMPANY
Dairy Equipment Division
Mora, Minnesota

For more data, circle 316 on Reader Service Card

Outstanding Accuracy

PALMER

Dial Thermometer

Check these functional features

- Direct-drive Bourdon Coil with a filled system for longer lasting accuracy.
- Stem can be placed at any desired angle and case can be rotated to most readable position.
- External calibration for zero setting.
- Unaffected by stem alignment.
- Accurate to one scale division.
- No sticking at any temperature.
- Non-corrosive case.

PALMER

THERMOMETERS, INC.
Mfrs. of Industrial Laboratory, Recording and Dial Thermometers
2515 Norwood Ave., Cincinnati 12, O.

For more data, circle 317 on Reader Service Card

gine. Both gasoline and LP fuel models are available.

Truck delivers 35 bhp. at 2,400 rpm., and a 2-speed constant-mesh transmission is standard equipment (torque converter drive optional).

Maximum stacking height is 131¼ in., with overall lowered height of 83 in., and 16¼-in. free lift. Having an overall width of 36½ in., its outside turning radius is 70 in. Clamps, side shifters, load back rests, and overhead guards may be employed with unit.—*Allis Chalmers Mfg. Co., Milwaukee.*

Circle 18 on Reader Service Card

Tabber Speeds Paperwork

Using the new Tabber Model 300, shipment-addressing stencils (arrow) are automatically applied on continuous invoicing forms at speeds up to 2,400/hr. This eliminates tedious manual-tabbing, thus streamlines paperwork.

Moreover, the unit counts the forms as they are tabbed. Up to 20-in.-wide forms are handled.

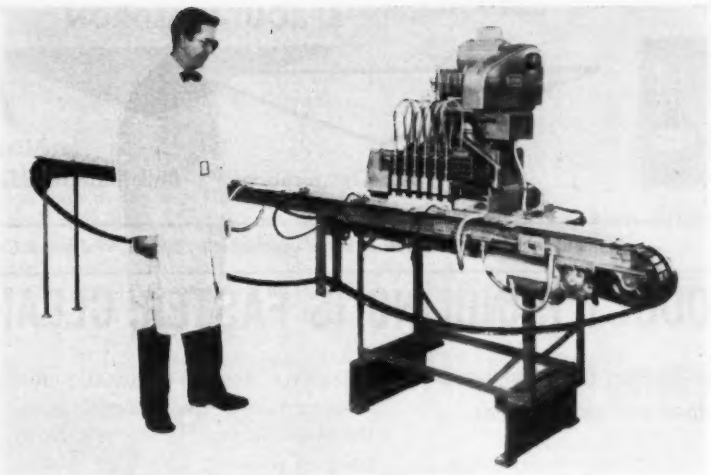
In operation, forms are placed on platform, from where they are moved automatically by pin feeds across tabbing plate. Stencil paper feeds from roll and is cut to size desired and spot positioned. Forms, with stencils attached, are then guided to special tilted stacking platform.

Stencil paper rolls (300 ft. lengths) are available with either carbon-coating or interleaved carbon tissue.—*Weber Addressing Mach. Co., Mount Prospect, Ill.*

Circle 19 on Reader Service Card

Want More Information?

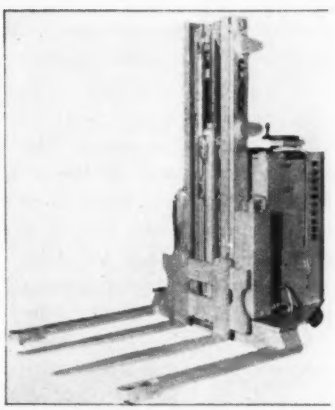
It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one at the bottom of each item) on the handy Reader Service Postcard—back of book. Then sign your name and address and mail.



Liquid Filler Employs 'No Mess' Nozzles

High-output Colton liquid-filling machine features plunging and centering nozzles. Their use, says maker, assures clean, mess-free filling of glass, metal, or plastic containers. Further, patented Exacto-metric metering cylinder is stated to keep volume of each fill accurate within 1%.—*Arthur Colton Co., 3400 E. Lafayette, Detroit 7.*

Circle 20 on Reader Service Card



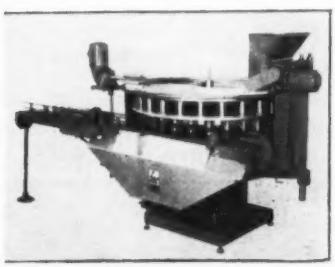
New Narrow-Aisle Stacker

Tiering of palletized materials in confined areas is special forte of this new battery driven unit called the Powrworker Rider Straddle Stacker. It's marketed in 2,000 and 3,000-lb. capacities, both at 24-in. load centers.

Truck negotiates aisles as narrow as 42 in. (minimum for right-angle stacking is 72 in.). Turning radius is 62 in. And travel speeds with load range to 4.2 mph., both forward and reverse.

Hydraulic system provides lift speeds to 25 fpm. Because of 5-point contact with floor, traction for drive and steering, as well as stability, is constant regardless of load carried. Easy maintenance is accented, with powerhead and battery readily removable while truck is in upright position.—*Clark Equip. Co., Battle Creek, Mich.*

Circle 21 on Reader Service Card



High-Performance Can Filler

Model ST Flexi-Filler, says maker, puts granular free-flowing foods into cans with new efficiency, accuracy, and speed. Fruits, vegetables, and specialty products are handled by 24-pocket unit (pictured) at rates up to 300 cpm. on 303x406 cans.

Though semi-automatic in design, filler may be used in full automatic operation with addition of an automatic hopper and adjustable brush on filling top. Also available are 12- and 18-pocket models.

Among features: Telescopic filling pockets which may be regulated for volume control; adjustable can-feed

SPROUT-WALDRON Pointers

for Mixing and Blending • Size Reduction
Size Classification • Bulk Materials Handling • Pelleting and Densifying

Published in the interest of better processing by Sprout, Waldron & Co., Inc., Muncy, Penna.

PRODUCT HANDLING IS FASTER, CLEANER, SAFER BY AIR

at modern C. F. Mueller food processing plant

Moving farinaceous material at the rate of 125,000,000 lbs. per year is a big job, even for C. F. Mueller Company, one of the world's largest producers of macaroni and egg noodle products. Here is what the Sprout-Waldron pneumatic bulk handling installation has accomplished:

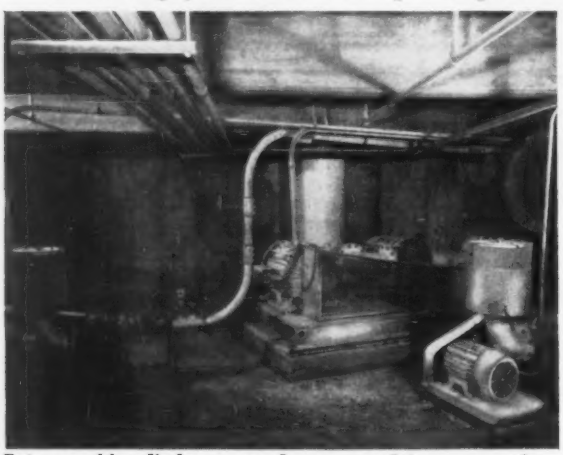
1. Saved more than 25,000 square feet of floor space.
2. Saved approximately $150,000 per year over previous mechanical and manual systems.
3. Simplified the maintenance of high sanitation standards.
4. Released more than $40,000 worth of materials handling equipment for other service.
5. Reduced the accident potential and simplified housekeeping and maintenance operations.

The unloading system consists of a negative pressure pneumatic unit which removes the material from the Airslide cars, elevates it to a product recovery unit from which it is taken by gravity through Gyro-Whip sifters which screen out oversized material and pass the product to a surge hopper. The material is then gravity fed into a scale where it is automatically weighed and recorded, then taken by positive pressure pneumatic system to any one of eighteen steel storage silos with a total storage capacity of 2½ million pounds.

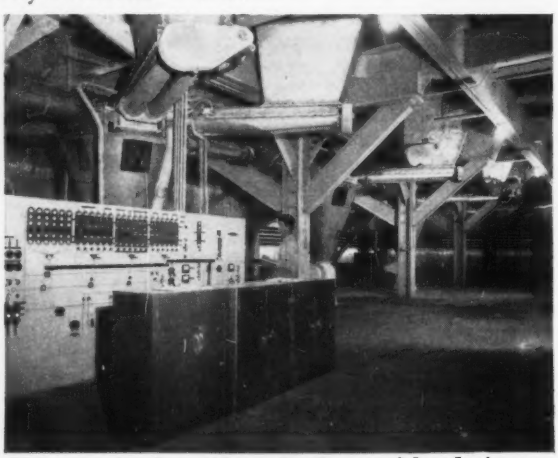
The silos are arranged in clusters of six with screw feeders set up to take the discharge into special blending surge hoppers. The blending system allows for the removal of material from any two or several of the eighteen silos at a pre-determined rate and for combining them into a homogenous blend which is then conveyed by positive pressure to any of the silos.

The positive pressure system is also used to convey the blended material from the storage silos to the processing plant. By a preselected plan this distribution system automatically fills any of the bins in the processing plant as they require material.

The design and engineering of this modern unloading, blending and distribution and storage system was accomplished by means of closest possible teamwork between C. F. Mueller Production Manager, John Curry; Plant Engineer, Charles Becht; Project Engineer, August Stark; and the Materials Handling Division of Sprout-Waldron. The entire operation, which when operating at capacity can receive, blend and deliver to the processing plant approximately 125,000,000 lbs./ year is handled by one man on each shift. For complete details, ask for Bulletin I-47.



Rotary positive displacement exhauster supplying vacuum for unloading operations. In foreground are positive pressure units supplying air to inplant transfer system.



Main operating floor with graphic flow panel board. Arrangement is so flexible that all three major systems can be operated simultaneously.

A complete listing of all Sprout-Waldron products and services will be found in the CEC catalog CP/112

conveyor, including spiral timer, guide rails, and lug chain; individual pocket cut-off plates; and no-can, no-fill device.—*Food Mach'y & Chem. Corp., P.O. Box 1120, San Jose 8, Calif.*

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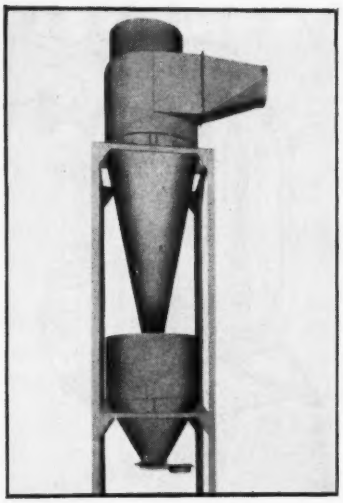
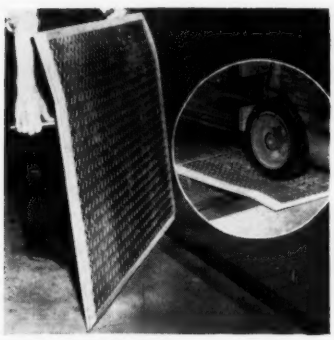


Top-Efficiency Cyclone

Developed for high-performance cyclone separation is this new Model 36 unit, which operates in 4,000 to 6,000-plus cfm. range. Test separation of 94% of flour by weight is cited. Details: Inlets and outlets are 14-in. Standard base has 30 cu. ft. storage capacity for dust, emptied through air-tight slide gate. Separator occupies 44x70½-in. floor space and measures 13 ft. 9⅜ in. from hopper outlet to top.—*Torit Mfg. Co., Walnut & Exchange Sts., St. Paul, Minn.* Circle 23 on Reader Service Card



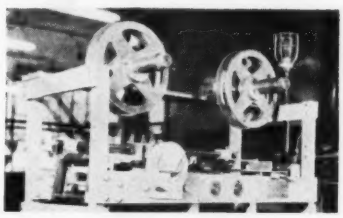
Easily-Handled Dock Plate

Latest dock plate—the Magna-Lum—is lightweight unit with special safety surface for maximum power-truck traction. Made of high-strength light-metal alloy, it's easily handled by one man.

Plates come in standard 48-in. widths, from 24 in. to 60 in. long. Other sizes are available. Load ratings range from 1,000 to 5,000-lb. axle load.

Features include: Positive position stops for secure lock between dock and carrier, beveled edges to minimize load jar and prevent load loss, crowned construction for smooth, safe cross-overs without "hang-ups," and bright-yellow edge markings.—*Magline Inc., 1900 Mercer St., Pinconning, Mich.*

Circle 24 on Reader Service Card



Automatic Web-Splicer

Designated the Twenty-Five Series, new automatic web splicers for packaging field mount directly on frame of web-consuming equipment, thereby saving space and making for more compact operations.

Splicing is automatically in registration without need of an operator to stop the machine for roll changes.

Different models are available to meet specifications of varying wrapper equipment.—*Butler Automatic Machine, Inc., 205 Broadway, Cambridge 39, Mass.*

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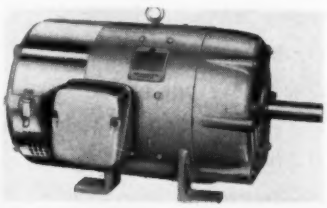

High-Performance Motors

Advanced, compact, d.c. motors (Flexitorq) are built for faster response, wider speed range, higher overload capacity. Offered in 1-200 hp. ratings, they're made in drip-proof form.

Design is for either constant or adjustable speed for driving such units as forming machines, conveyors, packaging equipment, and the like. Modifications are afforded for special applications.

For extra overload protection, mo-

Sauces
Cheeses
Gravies
Soups
Meat, Fish, Poultry

Now you can give them all a

Natural

Hickory Smoked

Flavor . . .

without expensive processing costs

It's easy to cash in on the increasing popularity of foods with a hickory smoked flavor. Just add these new naturally smoked seasonings to the foods you sell. Use Kater Autolysate, a naturally smoked autolyzed brewers' yeast extract, for cheeses, gravies, sauces and other foods requiring a liquid ingredient. Use naturally smoked Kater Bouillon for dry soup mixes, seasoning salts, crackers, chips and other foods requiring a dry ingredient. Both the extract and the dry bouillon are water-soluble, retain their flavor during processing, and blend completely and uniformly with other ingredients. These products are also available without hickory smoked flavor for use as a meat extract substitute and extender at a saving of more than 75% over meat extract.

WRITE FOR FREE SAMPLE . . . sent only to bona fide research or purchasing personnel. Write on company letterhead stating title and we will send sample postpaid.

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Manufacturing chemists for the food and pharmaceutical industries

415 W. Scott, Dept. FE Chicago 10, Ill.

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Valley Fresh Sweet Dairy Whey—high quality dairy ingredient

DON'T OVERLOOK THIS COST SHEET!

YOU CAN REDUCE MANY OF THESE COSTS!

By having the refrigeration system designed to meet your specific requirements and by buying the entire system of equipment from a manufacturer with a background of experience and reputation in this highly specialized field.

Frick Company has been designing, manufacturing, and installing commercial and industrial refrigeration systems since 1882.

Whatever type you need—cold storage, ice making, air conditioning, quick freezing, very low temperature, or process cooling—Frick engineers will design a system to serve you with dependability and economy.

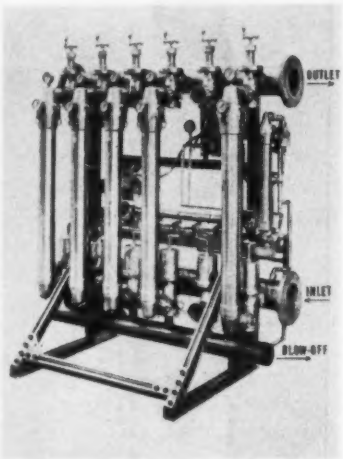
Let **FRICK ENGINEERS Provide a Frick System for You Today**.....

OFFICES AND DISTRIBUTORS WORLD-WIDE

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U.S.A.

tors employ a new Class B insulation. Use of this material has been a factor in reduced size and weight. Further noted are the quick-release latches that simplify inspection and maintenance.—*The Louis Allis Co., Milwaukee 1.*

Circle 26 on Reader Service Card



Filters Water In New Way

Differential pressure runs this newly patented automatic backwashing water filter. And, uniquely, the operation is on a dirt cycle rather than a time cycle.

Individual filters—any one removable without shutting down main unit—are employed on inlet, outlet, and blowoff headers. Filter's capacity ranges to 1,000 gpm.—*Ronningen-Petter Co., Vicksburg, Mich.*

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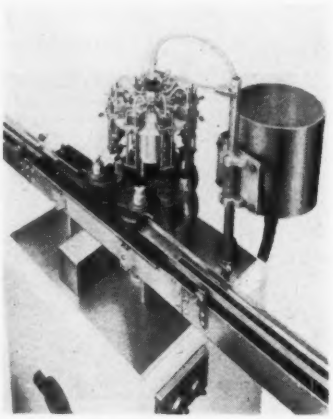

Fills Small Units at 100/Min.

Designed for filling smaller containers (to 4-oz. size) is new automatic liquid rotary vacuum unit

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Valley Fresh Sweet Dairy Whey—high quality dairy ingredient

Now—improve

QUALITY

and lower your food product ingredient costs

Discover the easy way to heighten flavor appeal, to improve texture, to extend shelf life. Watch your ingredient costs go down. Put Valley Fresh Sweet Dairy Whey to work for you.

This 100% dairy ingredient delivers uniformly superior results in virtually every type of food product. It improves bakery products, frozen desserts, candy, prepared mixes, smoked and canned meats, soft drinks and hundreds of others. Pound for pound, it is your most economical source of lactose (milk sugar) and lactalbumin protein.

And Valley Fresh Sweet Dairy Whey offers you this important extra: technical knowledge. At your disposal are the skill and experience of the world's largest whey products manufacturer.

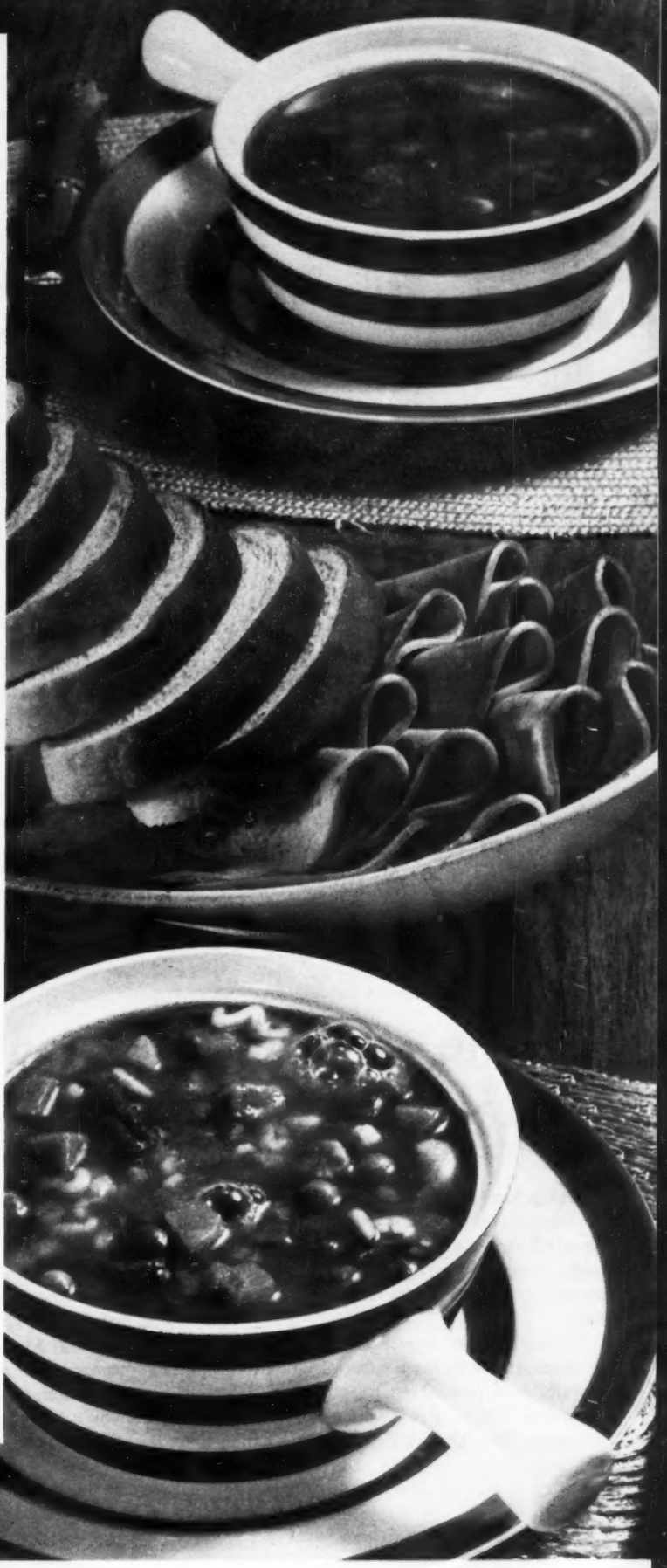
Send for the facts and figures on Valley Fresh Sweet Dairy Whey today. For technical bulletins and information on the many other Western food ingredients, write Technical Service: Dept. 16E.

Valley Fresh FOOD INGREDIENTS

WESTERN CONDENSING COMPANY

Appleton, Wisconsin

World's Largest Producer of Whey Products



Tobin Packing Co. uses 15 eye-catching Mack units like this Model B-60T for dependable, on-schedule deliveries of perishable meat products.

The ignition key won't be touched for the next 600 miles

When this Mack starts its run, the engine can't stop 'til the last customer has been served. Even when deliveries are being made, the engines must continue to operate to supply power for the refrigerator units.

Because failure of engines or components could mean the loss of a truck-load of valuable Arpeako First Prize meat products, Tobin Packing Co. of Rochester, New York, decided on dependable Mack tractors. Now their heavy-duty units total 600,000 miles a year on day-in, day-out express runs. Do it on-schedule, economically and without costly maintenance and downtime.

Cost sheets, maintenance men and drivers alike confirm that Macks' performance and economy make them stand out as the greatest truck buy today. Ask your Mack branch or distributor for the names of nearby Mack users who are cashing in on the earning superiority of their trucks. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
FIRST NAME FOR
TRUCKS

known as the VF/8M. Employing 8 stems, it fills liquids of varying viscosities at rates of 100 or more containers a minute.

Change-over from one container size or style to another takes mere minutes, since guard rails, head, feed and discharge wheels are readily removed after loosening of simple wing and knurled nuts.—*Climax Prod. Div. of Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati.*

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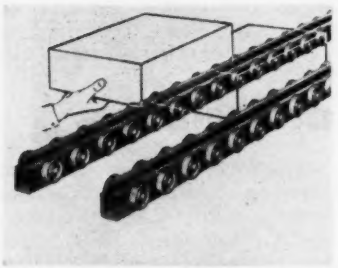

New FIFO Storage Rails

Basic improvement in the Versa-rack, special system for first-in-first-out live storage of cartoned items, permits heavier loadings and longer unsupported rail spans. Now employed are "Versarails" (photo). These are stronger, deeper tracks of closed tubular section.—*M. H. Standard Corp., 517 Communipaw Ave., Jersey City 4, N. J.*

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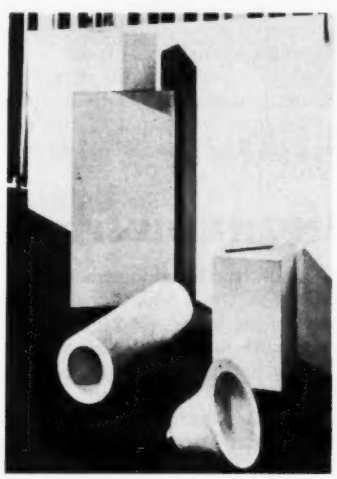


Anti-Fire Insulating Product

"Self-extinguishment" is built into new type Uni-Crest insulating material through use of special chemical additive during polymerization. Thus product—offered in slabs, sheets,

INCREASE VOLUME . . . DECREASE COST

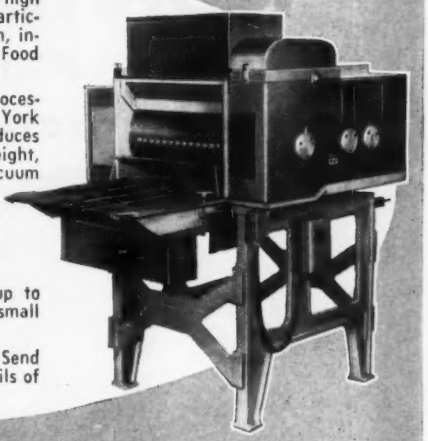
with a YORK FOOD *Rotary Portion Former*

If your product must be FORMED in high volume at a minimum of cost . . . particularly if it is a POTATO or FISH item, investigate the advantages of the York Food ROTARY PORTION FORMER.

Used by many of the leading food processors and packers in the nation, the York Food ROTARY PORTION FORMER produces portions of extremely accurate weight, size and shape **without** extruding. Vacuum forming prevents damage to even the most delicate ingredients, as many large confectionery manufacturers have demonstrated by their use of the ROTARY PORTION FORMER.

Cost-cutting capacities available up to 2500 lbs. of material per hour; 1800 small pieces per minute.

FREE BROCHURE gives all the facts. Send for your copy today and give us details of your requirements.



YORK FOOD MACHINERY CO.

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CY BELT says

"I can eliminate 'time lag' and speed production!"

Too often material in process can go only so far, and then must wait until somebody carries or pushes it to the next stage in the production line. The delay caused by the need for manual handling can frequently be eliminated by a *complete* conveyor system that reduces manual handling to the absolute minimum. Time is saved, unit costs are reduced, and the profit margin is widened. A trained Cyclone salesman can analyze your present materials-handling system to uncover time-wasting procedures, and suggest improvements. His analysis costs nothing, and his recommendation will be tailored to *your* plant and *your* needs. Just fill in the coupon.

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USS **Cyclone Metal Conveyor Belts**

Spiral Woven • Flat Wire • Flex-Grid

Prompt service to belt users is assured by two factories, one in the Middle West and one on the Pacific Coast.

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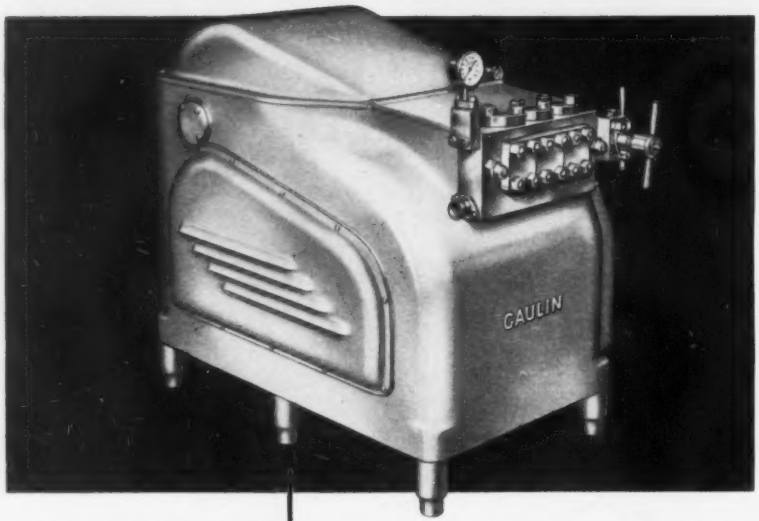
in Improved Particle Control ...Lower Ingredient Costs



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Flavor emulsions and extracts
Beverage concentrates
Fruit juices and concentrates
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Chocolate and Butterscotch mixes and syrups
Spices, spice oils and mustard
Baby foods
Soups
Cheese spreads
Mayonnaise
Dispersion of vegetable colors
Dispersion of fruit pulp
Plus . . . many classified applications in food laboratories and for new formula development

There are many good reasons for using Gaulin *Particle Control* in blending, dispersing or emulsifying your products. First, it improves texture, makes finer more uniformly stable emulsions. Second, it accents color. Third, it stops separation.

Why not investigate Gaulin Homogenizers, Sub-Micron Dispersers or Colloid Mills for your products? Send for Technical Bulletins H-55, LH-55, SMD-55 and C-57. Ask for Gaulin GTA . . . Gaulin Technical Assistance, too. Or if you prefer to try Particle Control in your plant, rent a Gaulin Laboratory Homogenizer or Colloid Mill for only $75.00 per month.

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blocks, and special forms (photo)—deters combustion.

With K factor of 0.23 at mean temperature of 40F., material is suited for use in freezers, cold storage rooms, truck and rail-car bodies. Insulating applications include breweries, dairies, ice cream hardening rooms, and milk coolers.

Made by fusing tiny polystyrene 'beads', material is odorless, nontoxic, and vermin-impervious. Light in weight, it's readily cut as desired. Board sizes are available up to a maximum of 12x4 ft. and 8 in. thickness. —*United Cork Cos., 50 Central Ave., Kearny, N. J.*

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CHEMICALS

New spray insecticide is of non-perfumed type to avoid hazards of odor-contaminations. Called Deodorized Raid, it has already been widely tested in a variety of food plants. Noted is its success against insects that have built up resistance to DDT and chlordane.—*S. C. Johnson & Son, Inc., Racine, Wis.* (31)

Field crates last extra years when dip-treated with new water-repellent preservative, Penta-WR. Agent is particularly formulated to protect against rot, mold, and mildew.—*Chapman Chem. Co., P.O. Box 138, Memphis 1, Tenn.* (32)

Sterilant for walls and floors of food processing and storage areas is new BPL (beta-propiolactone), which has proved particularly potent against micro-organisms. It's speedily applied in vaporous form, permitting resumption of area operations within a few hours.—*Wilmot Castle Co., 1931 E. Henrietta Rd., Rochester, N. Y.* (33)

INGREDIENTS

"Mono" type bread ingredient newly offered is Atmul 500. For use in all yeast-raised baked goods, it is cited as helping to retain "as-baked" softness in bread while improving grain and texture. Product is smooth, white fat preparation which, says maker, acts through "cell wall control" to give bakers a relaxed, easy to work, extensible dough.—*Food Indus. Dept., Atlas Powder Co., Wilmington 99, Dela.* (34)

Economical meat-extract substitute and extender, containing less than 0.5% salt, is now available in both

Nutrition-Conscious Customers Buy Fortified Products

You gain an edge over competition, create excitement *and* sales by fortifying with Merck Vitamins and Amino Acids. Almost any processed food is a candidate for fortification, and you can choose from nearly a dozen Merck Nutrients—all easily adaptable to normal food processing operations.

You'll find unlimited possibilities for developing new products by adding extra nutrients—not just those for which the Government has set Minimum Daily Requirements (Vitamins A, D, B_1, B_2, Niacin), but other essential nutrients like Vitamin B_{12}, Lysine, and Vitamin B_6—each loaded with consumer glamour.

Merck can supply you with all these nutrients—and top-notch technical service to boot. Just call in your Merck representative or write directly to Rahway for the details.

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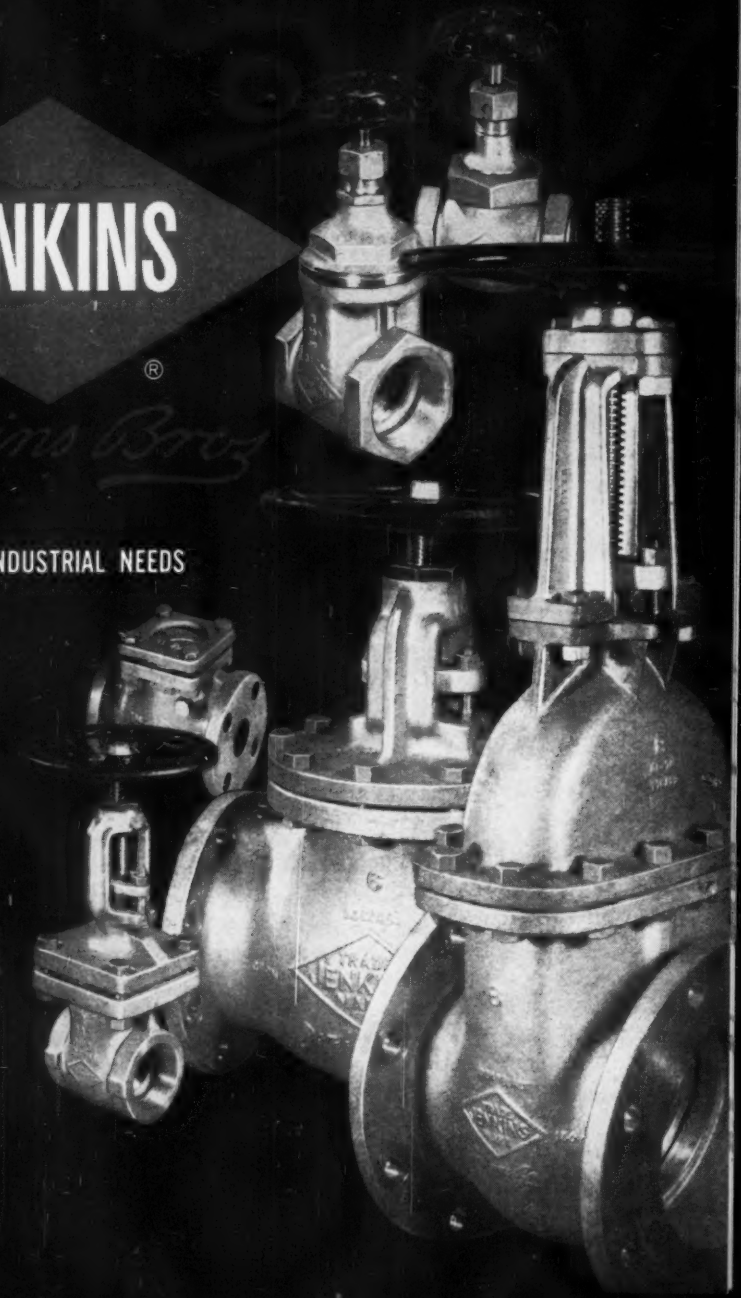
STAINLESS STEEL VALVES *too*

JENKINS ®

Jenkins Bros



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For solid reasons, men who ask for the best in Stainless Steel Valves have full confidence when they see the Jenkins Diamond. For almost a century this mark has appeared only on valves made to peak standards of quality in design . . . in castings . . . in machining. JENKINS standards, enforced by the most rigid inspection and testing in the valve industry.

Valves of corrosion resistant stainless steels have been made to those high standards by Jenkins for a quarter of a century. And today, the line of Jenkins Stainless Steel valves includes types and alloys to fully satisfy most service requirements.

They are available through the same leading distributors everywhere who sell Jenkins Valves of Bronze, Iron and Cast Steel. Jenkins Bros., 100 Park Avenue, New York 17, N. Y.

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paste and powder form. Approved for use in Federally inspected plants, product is stated to carry high levels of total nitrogen, amino nitrogen, peptones, peptides, and all B-complex vitamins and growth factors recovered from autolysis of brewers' yeast.—*Vico Prod. Co., 415 W. Scott St., Chicago.* (35)

BRIEFS

New Analytical Balance for lab work is special two-pen unit that automatically records both weight and temperature against time on single chart.—*Wm. Ainsworth & Sons, 2151 Lawrence St., Denver.* (36)

Washing Brushes for improved machine cleaning of produce are tradenamed 'Metlkor'. Roller units employ Tynex Nylon bristles that keep form despite soaking. Soap savings are cited.—*M. W. Jenkins' Sons, Inc., 444 Pompton Ave., Cedar Grove, N. J.* (37)

In-Plant Feeding machines (coin-operated) may be installed in series for complete meal selections by employees. Highlight is 'hot platter' unit that cooks 50 aluminum-trayed meals (varied menu) at a time and individually dispenses them.—*Rudd-Melikian, Inc., Hatboro, Pa.* (38)

Chain Drag Conveyor, newly announced for moving various food materials, is completely self-cleaning unit. It employs drag blades mounted on roller chains moving continuously over a smooth steel slide. Chances of choke-ups are eliminated by built-in return circuit, whereby any material not discharging travels back for re-run with subsequent incoming flow. Various points of inlet and discharge are afforded.—*Sprout, Waldron & Co., 130 Logan St., Muncy, Pa.* (39)

Paper Baking Pans (Bake-Rite) require no greasing, due to use of new specially treated paper lining. Thus, labor is saved and there's smoother "no-stick" finish of baked goods, such as meat loaves and other molded meat specialties.—*Basic Food Materials, Inc., Vermillion, Ohio.* (40)

Water-Level Gage is designed for boilers in medium-pressure field. It gives two-color readings (red for steam, green for water).—*Yarnall-Waring Co., Phila.* (41)

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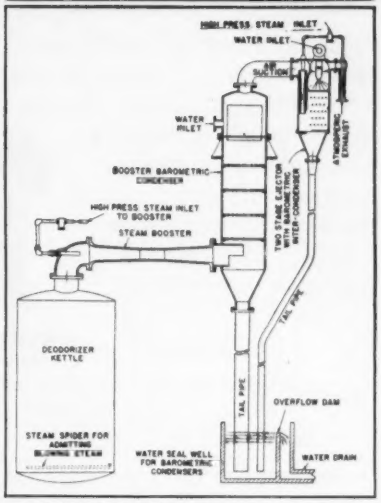
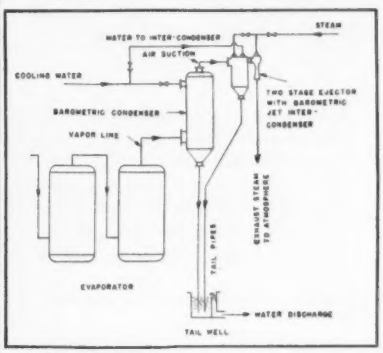
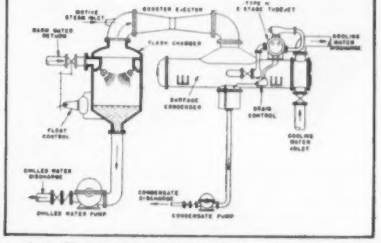
Here's how to get high vacuum at lower cost... from C. H. WHEELER



In Deodorizing Operations—C.H. Wheeler Tubejet® Booster with Barometric Condenser, and 2-stage Tubejet with Wheeler Barometric Inter-Condenser, produce high deodorizer vacuum. No moving parts means less Tubejet maintenance.



In Evaporation, Tubejet Ejector works with Wheeler Barometric Condenser to produce high vacuum. Initial cost of Ejector is low installation easy because of lightness, simple connections.



C. H. Wheeler Steam Jet Vacuum Refrigeration is used extensively in producing cold process water for food and chemical plants. Where there is an abundance of steam at low pressure and cooling water for the condensers, this is an ideal way to produce chilled water at low cost, with trouble-free equipment.

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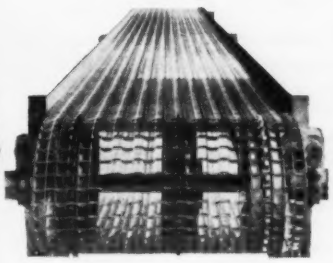
LA PORTE

FLEXIBLE STEEL CONVEYOR BELTING



Built to last, this long-wearing, flexible steel belting resists impacts at the loading hopper and on the shipping dock. It remains free from distortion and flexible under extreme temperature changes. Besides, it maintains a perfectly flat surface for containers empty or filled.

The open mesh feature, which assures a positive drive on the sprocket, permits the circulation of air and liquids around products in process. Also, facilitates sterilizing with steam gun while in motion.

The endless belt for endless service in canning, freezing, pickling and dehydrating.

Made of galvanized steel of the best quality, La Porte belting is available in ½" x 1", or 1" x 1" in any length and practically any width.

LA PORTE

Ask your Mill Supplier or write for illustrated literature, prices.

MAT AND MFG. CO.

BOX 124 *La Porte, Indiana*

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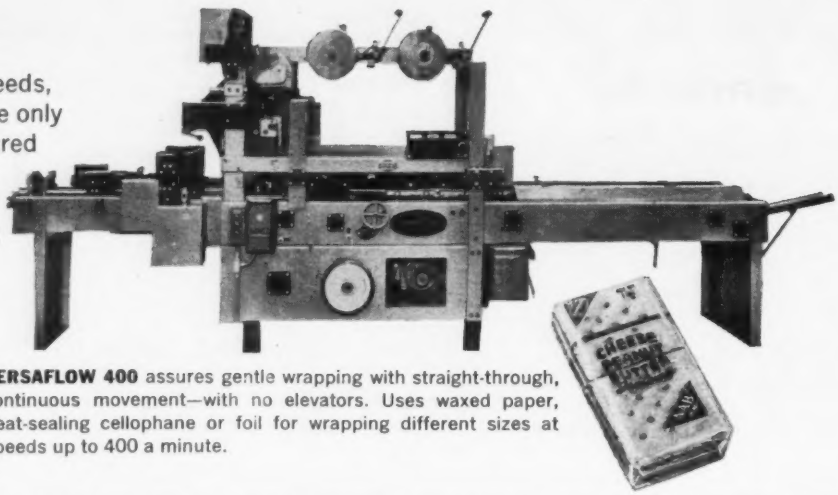
For Speed and Versatility in

BISCUIT and CRACKER WRAPPING

. . . PACKAGE offers a complete line

Precision wrapping, high speeds, gentle handling . . . these are only a few of the advantages offered by the full line of PACKAGE wrapping and bundling machines, designed to meet the demand for packages that sell . . . wrapped on machines that save.



VERSAFLOW 400 assures gentle wrapping with straight-through, continuous movement—with no elevators. Uses waxed paper, heat-sealing cellophane or foil for wrapping different sizes at speeds up to 400 a minute.

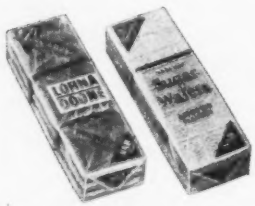
MODEL FA is the most versatile of all Package models. Adjusts quickly to handle a wide size range. Speeds up to 120 packages a minute; handles full range of wrapping material including polyethylene. Wraps cartons, open trays or quarter pounds.

FORGROVE MODEL 4C wraps loose biscuits and crackers in package lengths up to 8" long. Handles a variety of shapes and sizes and is gentle enough for the most delicate product. Uses heat-sealable materials at speeds from 40 to 60 packages a minute.

VERSAFLOW 150 provides continuous, uninterrupted flow from infeed to discharge, assures gentle handling at speeds up to 150 a minute. The Versaflow 150 wraps in a variety of heat-sealable materials, handles a wide range of sizes.

MODEL F10 BUNDLER is designed to save material costs by replacing cardboard boxes with machine-made bundles. Overwraps in kraft paper and applies printed end seals. Wraps different sizes at 8 to 24 bundles a minute.

TRANSWRAP automatically measures the product, forms and fills the package, then seals it, ready for the consumer. Equipped with a new net weight scale designed to eliminate weighing error, and provide maximum accuracy at high speeds.



DF1 is a versatile machine that will handle a variety of small packages with neat, attractive wraps. Perfect for high-speed wrapping of crackers used in vending machines.

Call your PACKAGE representative today, for profitable packaging tomorrow.

PACKAGE MACHINERY COMPANY, EAST LONGMEADOW, MASS.

NEW YORK • PHILADELPHIA • ATLANTA • BOSTON • CLEVELAND • CHICAGO
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Air & Gas Dryers. Includes design features and uses, with photos, diagrams, and selection chart. 6p.—Desomatic Products, Inc., Falls Church, Va. (88)

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Control Systems. Details custom-engineered panels for drying, baking, and food processing, materials handling, and related fields. 4p.—Protection Controls, Inc., Chicago. (94)

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Speed Reducer. Describes new worm-gear model that can be mounted in 3 different positions, with tables on service factors, load classes, input hp, overhung load, and thrust load ratings. 8p.—Link-Belt Co., Chicago. (97)

Hot Water Boiler. Tells how new design, for forced circulation, permits unit to withstand 3 times rated capacity. Includes curves, tables, charts, photos. 8p.—Orr & Sembower, Inc., Reading, Pa. (98)

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Plastic Piping. Handbook describes technology, installation and coupling methods. Gives temperature and working pressures, effects of 280 chemicals on 5 different plastics, etc. 16p.—Chemtrol, Lynwood, Calif. (101)

Instantaneous Heaters. Introduces new, pre-engineered, fully standardized line in 128 sizes. 23p.—American-Standard, Industrial Div., Detroit. (102)

PROCESSING

Dryer - Blender - Sterilizer. Tells how new unit enables food manufacturers to process heat- and moisture-sensitive bulk materials. 4p.—Wilmot Castle Co., Rochester, N. Y. (103)

Drum Warmers. Describes automatic units for use with

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BETTER JAMS
Jellies and Confections Because...

1 Wide pH Range
2 Uniform Strength
3 Neutral in color and flavor—blends naturally with more different fruits than any other pectin
4 Makes jams & jellies with an even, smooth texture (never grainy) and improved spreadability

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viscous or sensitive materials such as chocolate, syrups, etc.—Harold L. Palmer Co., Farmington, Mich. (104)

Continuous Centrifuges. Pictures 5 models for sludge removal from food and food byproducts, etc. 8p.—Centrico, Inc., Englewood, N.J. (105)

Ribbon Blenders. Gives construction features, dimensional, and mechanical specifications. 8p.—J. H. Day Co., Cincinnati, Ohio. (106)

Chemical Feeder. Describes equipment for metering, feeding, and regulating low flow rates of defoaming agents, rust and scale inhibitors, etc.—Fischer & Porter Co., Hatboro, Pa. (107)

PACKAGING

Gas-Packaging. Describes firm's customer-helps for prospective users of compressed gases for food aerosols, conventional packaging, etc. 6p.—Air Reduction Co., Madison, Wis. (108)

Package Opener. Tells how "Zip-Tape" modernizes packages, simplifies bundling for store shipment, color codes for freshness. Foldout guide for size, type, and lineal inches per lb.—Dobeckmun Co., Div. of Dow Chemical Co., Cleveland. (109)

Corrugated Board. Description, specifications, and performance data on new moisture-resistant board for shippers wet products. 4p.—Hinde & Dauch, Sandusky, Ohio. (110)

Labels. Shows hundreds of "powerful sales persuaders" in color. Tells how label can increase shelf visibility, highlight unique product features, compensate for missing or disinterested sales clerk. 48p.—Allen Hollander Co., N. Y. City. (111)

Bagger. Engineering data operational details of weigh-fill unit that handles up to 22 bags (50-lb.) per min. 4p.—Bemis Bro. Bag Co., Minneapolis. (112)

Automatic Filling Scales. Illustrates 10 main types and gives specifications, capabilities. 4p.—Thayer Scale Corp., Pembroke, Mass. (113)

Plastic Packages. Cites advantages of vacuum formed blisters, slide packs, lightweight protection for such perishables as fruits & vegetables. 4p.—Hopple Plastics, Inc., Cincinnati, Ohio. (114)

MATERIALS HANDLING

Fork Truck. Heavy duty cantilever model with short turning radius. 2p.—Barrett-Cravens Co., Northbrook, Ill. (115)

Materials Handling. Defines basic concepts, gives costs and objectives, and tells how proper equipment is selected. 16p.—Material Handling Institute, Inc., Pittsburgh. (116)

Storage Tanks. Data sheet on specially engineered models with live bottoms. 2p.—Sprout, Waldron & Co., Inc., Muncy, Pa. (117)

Palletless Handling with electric industrial trucks. 4p.—Lewis-Shepard Products, Inc., Watertown, Mass. (118)

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Sanitation Aids. Roundup of new insect and rodent control "weapons", cleaning tools. 6p.—Hugé Co., St. Louis, Mo. (120)

Masks. Discusses history, use, hazards, and protection for users of modern insecticides and fumigants. 4p.—Acme Protection Equipment Co., S. Haven, Mich. (121)

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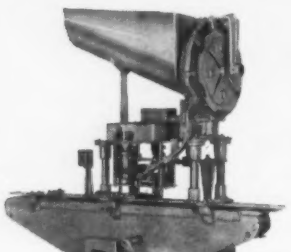
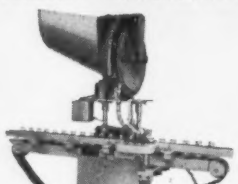


The RESINA line of CAPPERS include models for sorting, feeding and applying a great variety of caps to bottles, jars or cans from ½ ounce to gallons. Speeds available up to 120 per minute.

TOPS THEM ALL

fully automatic

FITMENT APPLICATOR



Automatically selects plastic fitments (solid or perforated) with or without lift tabs and orients them into a chute. Passing container picks up fitment which is then snapped on the container. Speeds available up to 120 per minute or higher.

Descriptive literature and specifications on request.

RESINA AUTOMATIC MACHINERY COMPANY, INC.
572 SMITH STREET • BROOKLYN 31, NEW YORK

ATTENTION!
Vertical or Horizontal steam retort users!

Cook-Chex takes the last trace of guesswork out of production control.

1. Eliminate wrong cook schedules.
2. Keep retort baskets in sequence.
3. Guard against "by-passing" retorts.
4. Provide low-cost permanent records for your cooking-plant.

Cook-Chex is the chemically impregnated retort tag that changes from purple to green *only* after your run has been properly and completely retort processed. Hang a Cook-Chex on each basket before retorting—inspect it after withdrawing. You have the full "protection" record at a glance. It's that easy—that sure.

Used by *all* major packers. Approved and recommended by cannery inspectors. Ask *them!*

Send for Free samples.

ASEPTIC-THERMO INDICATOR CO.
DEPT. FE-5
11471 Vanowen St., North Hollywood, California

Put this truck to work . . . without buying it!

For many companies, even the savings resulting from the use of the *right* equipment is overshadowed by the capital investment necessary. The logical answer, in such a case, is to lease.

Without tying up a cent of working capital, the Clark Lease Plan permits you to select materials handling equipment from the world's *most* complete line. No down-payment or outside financing is necessary, and you have the added advantage of dealing directly with your local Clark dealer.

The savings the equipment brings are usually greater than the leasing rate. In fact, most users of the Lease Plan find the cost-cutting factors of using modern handling equipment *far outweigh* the modest monthly rates. For a detailed brochure giving full particulars of the Clark Lease Plan, simply write: Leasing, Clark Equipment Co., Battle Creek, Michigan.

CLARK® EQUIPMENT

NOW THE GREATEST LINE IN FILLING MACHINE HISTORY BEARS A GREAT NEW NAME

Arthur Colton Company has purchased the 50-year-old Hope Machine Company, thus offering a total of 125 years of filling machine experience and the only *complete* line of filling equipment for the pharmaceutical, food products, paint, chemical, petroleum, cosmetics and dairy products industries.

Now, for fast, accurate, large volume fills of liquid, viscous and semi-solid products, the Colton-Hope piston-type fillers round out our complete range, including the most widely accepted equipment for aerosol container and tube filling, tableting and capsulating.

All Colton-Hope machines will be engineered and manufactured in the Michigan plants of Arthur Colton Company. The combined facilities and experience of the two great pioneers will further expand the special applications and engineering services always provided by both companies. Sales and service will be handled by an augmented Colton staff.

This important acquisition is the fourth by the Arthur Colton Company since it became a division of Snyder Corporation in 1949, all aimed at developing and marketing better high speed machinery for the packaging and pharmaceutical fields.

ARTHUR COLTON COMPANY

DIVISION OF SNYDER CORPORATION

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PLANT NO. 2—1030 McDOUGALL, DETROIT • PLANT NO. 3—MANCELONA, MICHIGAN

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Specialists in Drug, Chemical and Filling Machinery for 75 Years

lems. Available on loan basis. State date desired.—Dempster Bros., Knoxville, Tenn. (122)

Socket-Weld Fittings for high pressure and wide temperature range. 4p.—The Special Screw Products Co., Bedford, Ohio. (123)

Rubber Products ranging from conveyor belts to hoses. —Hamilton Rubber Mfg. Corp., Trenton, N. J. (124)

TRANSPORTATION

Covered Hopper Car. Details new model developed to provide economical bulk transportation for dry materials. 4p.—General American Transportation Corp., Chicago. (125)

Trucks. Presents firm's new models—high-, low-, and medium-tonnage, and special purpose.—Dodge Div., Detroit. (126)

INSTRUMENTS

Instrumentation. Index lists firm's industrial and valve division's press material, product catalogs, instrument specifications, technical and systems bulletins. Also data sheets, complete alphabetical subject-company index of instrumentation magazine articles, and other educational aids and services. 24p.—Minneapolis-Honeywell Regulator Co., Philadelphia. (127)

Control Valves. Gives construction and operating characteristics of company's line of liquid control unit. 12p.—Conoflow Corp., Philadelphia. (128)

"Robot Chemist." Covers operating principles and procedures for automated system of continuous chemical analysis. 8p. — Technicon Controls, Inc., Chauncey, N. Y. (129)

QUALITY CONTROL

Lab and Plant Apparatus. Catalog lists over 450 different pieces. Illustrates and describes such items as constant temperature baths, drying ovens, environmental units for humidity, altitude, and low temperatures, bench and floor model centrifuges, and many others. 175p.—Labline, Inc., Chicago. (130)

Pocket pH Meter. Comes in water-proof and fungus-

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best
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SPRAY NOZZLES
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2. You have thousands of capacities to choose from . . . for more exact volume control.
3. You have a complete choice of materials for chemical compatibility.
Your inquiry is invited.
LIQUID
SPRAYING SYSTEMS CO.
3212 Randolph Street
Bellwood, Ill.
For complete spray nozzle information write for Catalog 24.

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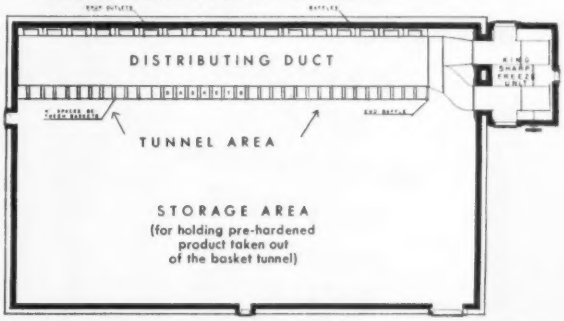
HARDENING TIME
REDUCED 75% WITH
KING
ZONE TUNNEL
Midwest Dairy Products, a division of City Products Corp., has recently converted three plants, Memphis, Tenn., Ruston, La., Duquoin, Ill., to *King Sharp Freeze and Zone Tunnel Systems*. According to Thomas Cartwright, Chief Engineer of Midwest Dairy Products, "the *King System* with the *King Zone Tunnel*, has decreased hardening time from 36-48 hours to 8-10 hours . . . (and) increased the hardening room storage capacity by 25% to 30% due to the stacking procedure used." Mr. Cartwright also pointed out that the flexibility of the *King System* combined with the *King Zone Tunnel* was particularly desirable because "it can be added to without a lot of capital expense."

This Fortune Ice Cream plant in Memphis was the first Midwest Dairy Products plant to get a King System.



Typical plan of combination hardening room and storage area with *King Zone Tunnel System*.

Section view of *King Zone Tunnel* showing basket stacking arrangement. *Air Blast* through product produces rapid hardening and improved quality.

Write for King *detailed technical bulletins. 50 years experience is at your service.*

KING ZONE TUNNEL SYSTEM

COMPANY OF OWATONNA

905 North Cedar Street • Owatonna, Minnesota

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Above SUPERESINS* available in 5 gal. (35 lb.) steel pails with pouring spouts and covers.

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Fully conforming to standards developed by the U. S. Quartermaster Corps, these easy-to-use SUPERESINS* effectively replace their respective natural spices. All are produced in our own plant under constant analytical control from the finest grade of selected spices. Where necessary they contain additions of the corresponding top grade essential oils. Used as recommended in Federal Specifications (EE-S-645) by incorporation with a dry soluble edible carrier, FRITZSCHE'S SUPERESINS exhibit the true-to-nature character of the finest available spices. Extended in this manner they replace the natural spice pound for pound. Confident of their wide acceptance by the food and meat packing trades, we offer them immediately at the most attractive prices possible. We urge you to check the accompanying list and request samples and prices of those SUPERESINS* that interest you.

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proof case with shoulder strap. 2p.—Analytical Measurements, Inc., Chatham, N. J. (131)

Spectrophotometer. Operation, accessories and specifications of new double-beam infra-red instrument described. 4p.—Perkin-Elmer Corp., Norwalk, Conn. (132)

INGREDIENTS

Brewers Yeast. Data sheet on new products for use in vinegar and other fermentation fields as components of growth media.—Amber Laboratories, Milwaukee. (133)

Mineral Fillers. Covers characteristics and applications of Dicalite. Supplies technical data on its uses. 12p.—Dicalite Dept., Mining & Mineral Products Div., Great Lakes Carbon Corp., Los Angeles. (134)

Industrial Protein. Tells how new corn product Zein was developed, discusses applications and advantageous characteristics. 16p.—Corn Products Sales Co., New York, N. Y. (135)

"Corn Syrups & Sugars." Reissue groups products in four major classifications. Covers manufacturing, chemical and physical properties, recommended equipment, and procedures for handling. Includes 12 tables and glossary of technical terms. 45p.—Corn Industries Research Foundation, Inc., N. Y. City. (136)

Essential Oils, Aromatic Chemicals, etc. Price list available to wholesale purchasers. 12p. — Fritzsche Bros., Inc., New York City. (137)

MANAGEMENT

Plant Security. Thumbnails major areas, and details cost-saving services. Includes prevention of in-plant thievery, fires and damage, traffic management, etc. 16p.—Pinkerton's National Detective Agency, Inc., N.Y.C. (138)

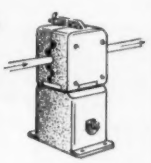
Decentralization. Provides yardstick for process, emphasizing that hasty or ill-advised action may do more harm than good. Suggests that firm's communications automation equipment will help. 6p.—Remington Rand Div., Sperry Rand Corp., N.Y.C. (139)

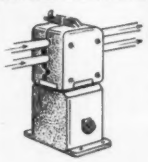
PUMPING IDEAS

POSSIBLE ONLY with a SIGMAMOTOR PUMP

MOVE CORROSIVE LIQUIDS

Material being pumped never comes in contact with pump mechanism. Wave-like motion of steel fingers forces material through Tygon tubing. By changing size of tubing, capacity can be increased or decreased. Pump housing opens for removal and insertion of tubing.



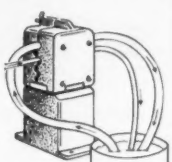


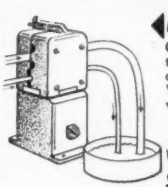
PUMP 2 OR 3 DIFFERENT LIQUIDS SIMULTANEOUSLY

Some models will accommodate up to four tubes so that four different liquids can be passed through the pump at one time without danger of contamination.

FEED AND MIX

One or more tubes can be feeding material to a mix while a larger tube is recirculating the liquid to produce agitation and thorough mixing. Viscous materials can be pumped without danger of gumming or plugging. Remove tube and pump is clean.





METER ADDITIVES

One or more additives can be pumped to a solution in the exact amount desired by selecting the correct size of tubing and regulating pump speed. Various controls can be incorporated to close valves ahead of pump.

Capacities from 0.5 cc. per min. to 4.5 G.P.M.

Write for complete information on sizes and capacities.

SIGMAMOTOR, INC.

22 N. Main Street • Middleport, N. Y.

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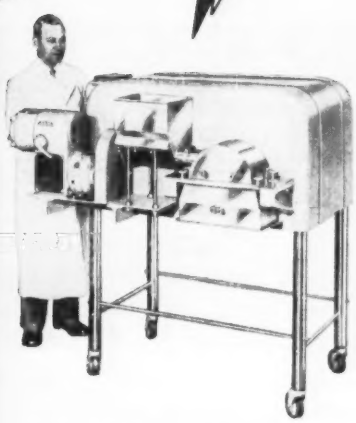
CAUTION

AGAINST CONTAMINATION starts with COG!



All product contact areas of the new Cog-Mill are of stainless steel, and quick and thorough cleaning is permitted by the EXCLUSIVE snap-apart design.

CHOPS
GRINDS
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solids, and
BLENDS

liquids and practically all solids to any desired consistency.

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Models for variable speed manual or continuous feeding by 7½ to 20 H.P. motors.

Send for details, designating product to be processed.

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Division of Motiograph, Inc. *Established 1896*

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A TORRES EXPORT, INC.,
2550 W. Peterson Ave., Chicago 45, U. S. A.

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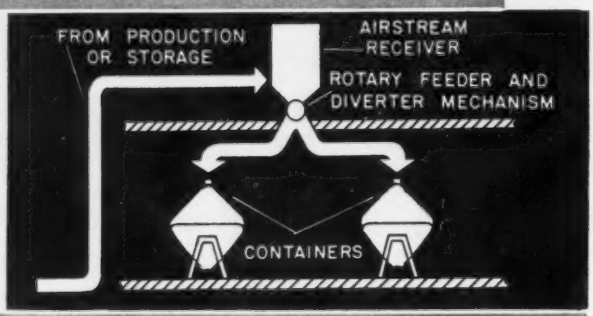
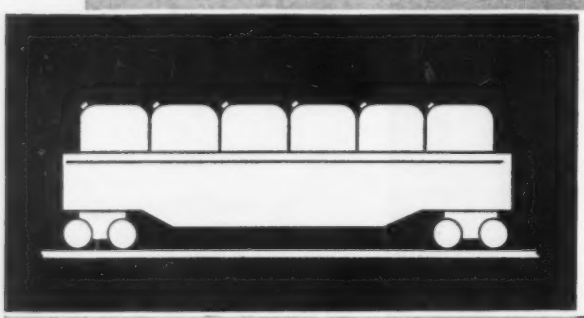
a new concept in high-purity bulk handling!

Dracco *Airstream* conveyors + collapsible containers

Shipping, receiving and storing high-purity materials in collapsible rubber containers has streamlined between-plant bulk handling. Now Dracco has adapted its advanced pneumatic conveying techniques to this important new method, providing a thrifty combination of automation and sanitation which maintains the highest standards of product purity.

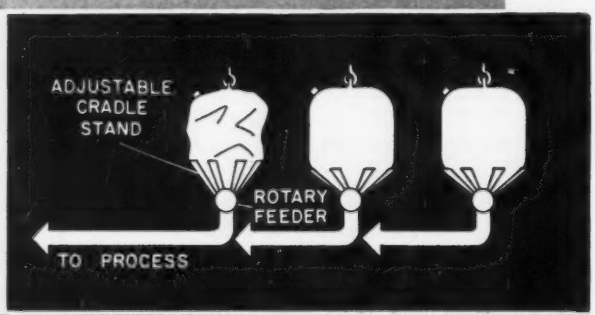
Load containers directly from production or storage with Airstream Conveyor System. Handling is fast, automatic, completely enclosed. One-man supervision saves labor costs.





Ship via rail, truck or barge. Store outside until contents are needed. Containers are air-tight, weather-proof, reusable.

Unload and distribute material to process with Airstream Conveyor System. No loss or waste. Material is never exposed to moisture or contamination.



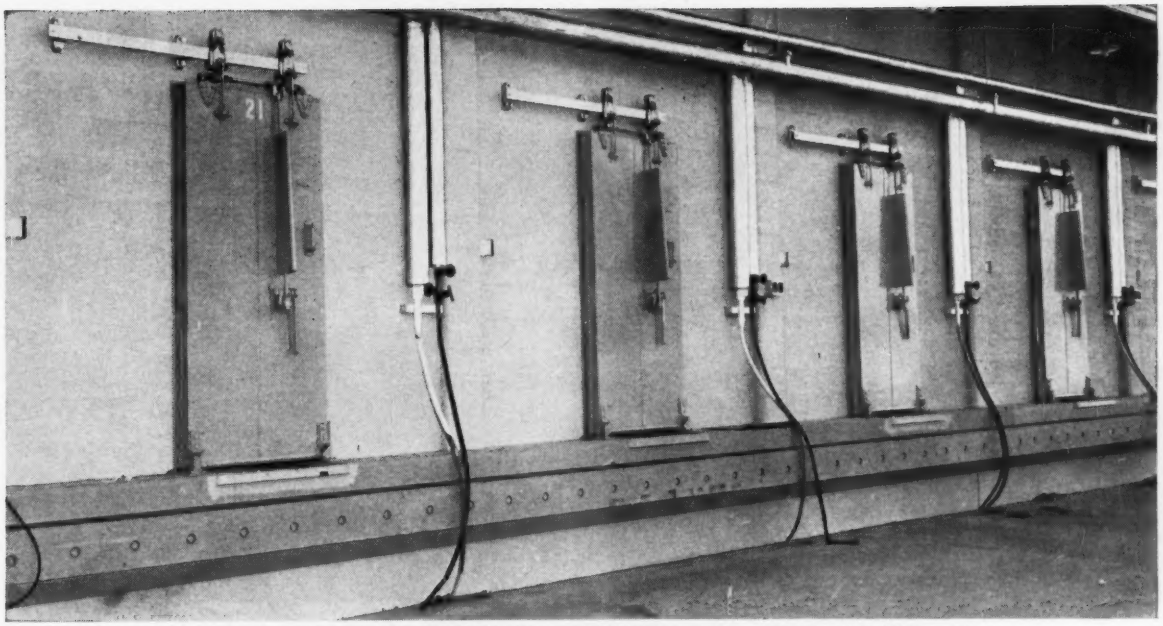
Automatic Airstream Conveyors can be teamed up with all types of portable containers to introduce faster, better handling at less cost. Write or call for further information.

DRACCO DIVISION OF FULLER CO. 4045 East 116th Street • Cleveland 5, Ohio

Details on this new concept are presented in a new 12-page report "New Techniques for Automatic Bulk Handling", now available from Dracco.

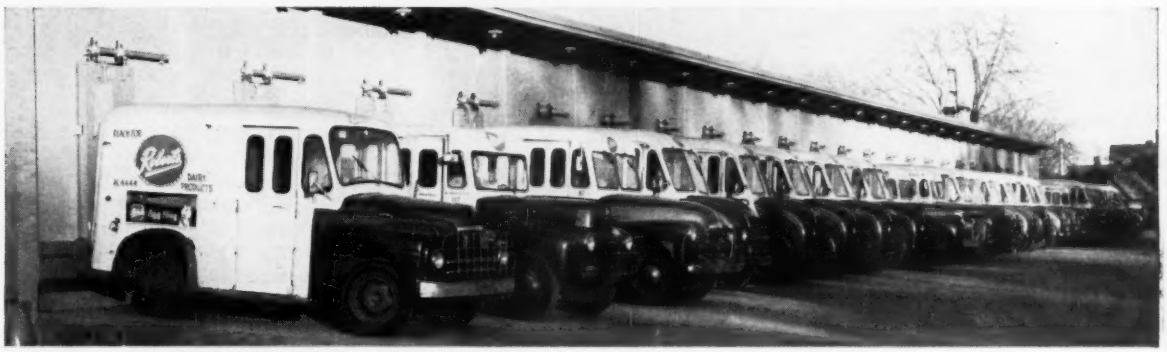
DRACCO *airstream* conveyors
dust control equipment

(Pronounced Dray'co)

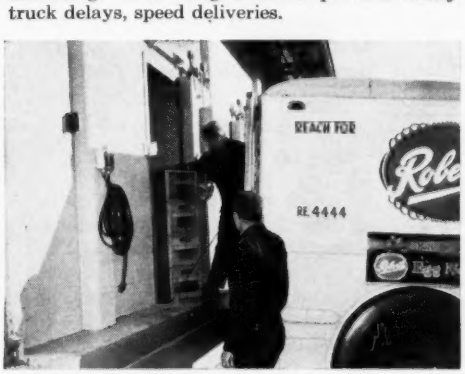


SOLUTION TO MATERIALS HANDLING PROBLEM—Jamison Horizontal Sliding Doors are located on loading docks on both sides of long, narrow sales-cooler building.

48 Jamison doors speed handling in new dairy sales-cooler building



FASTER, MORE CONVENIENT loading and unloading. 48 loading stations prevent costly truck delays, speed deliveries.



SPACE-SAVING Horizontal Sliding Doors facilitate high volume movement of dairy products.

Architects: Cecil A. Martin & Associates—Omaha, Nebraska
Hertel, Johnson, Eipper, Stopa—Chicago, Ill.
Insulators: Low Temp Insulations—Omaha, Nebraska
Contractors: A. Borchman & Sons—Omaha, Nebraska

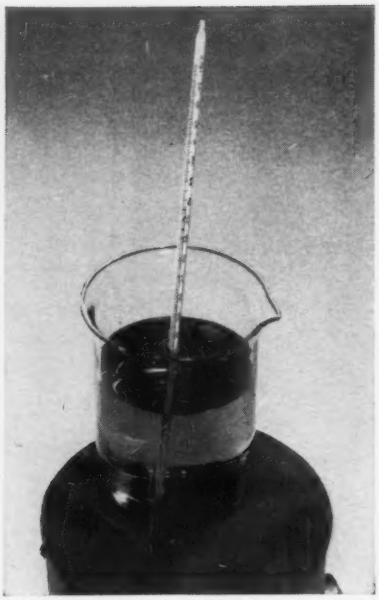
• In a unique demonstration of modern dairy efficiency, the Roberts Dairy Company, Omaha, Nebraska, has accelerated handling and streamlined operations with a new 241′ long sales-cooler building. Jamison Single-Leaf Horizontal Sliding Doors are an important feature of this new facility.

The doors are designed to save space, minimize refrigeration loss and to provide easier, faster loading and unloading. Jamison doors are available in many types and sizes for practical, economical solutions to any problem. For additional data, consult your architect or write to Jamison Cold Storage Door Co., Hagerstown, Md.

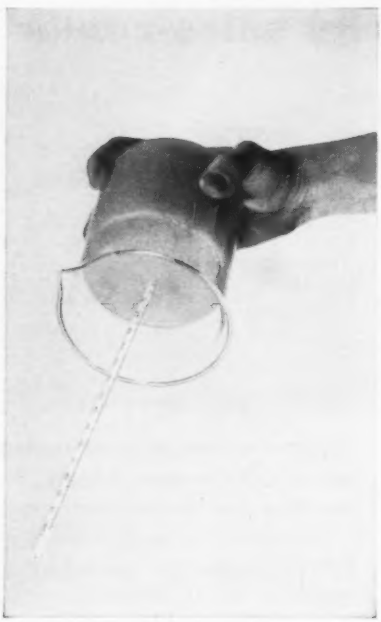
JAMISON
COLD STORAGE DOORS

Industry Moves

Stir this distilled monoglyceride into cottonseed oil



heat to about 75°C; cool



and the oil becomes a stiff solid.

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You can achieve this effect only if the monoglyceride you use is exceptionally pure. We make such monoglycerides by molecular distillation in carload lots. *Myverol® Distilled Monoglycerides* is the name. Would you like to know more? Write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

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Also . . . vitamins A and E

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Refrigeration Reference

REFRIGERATION AND AIR CONDITIONING *by W. F. Stoecker. Published by McGraw-Hill Book Co., 330 W. 42ND St., New York City 36. 1958. 397 p. Price:* $8.

In this book the analytical approach of refrigeration and air conditioning is carried another step forward. Emphasis is placed on the modern concept of the subject as a synthesis of the fundamentals of the thermodynamics, heat transfer, and fluid mechanics.

While the commercially important vapor-compression cycle is emphasized, special types of refrigeration systems are treated concisely. Principles of heat transfer are incorporated to analyze the performance of actual equipment.

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THE SELECTION OF RETAIL LOCATIONS *By Richard Lawrence Nelson. Published by F. W. Dodge Corp., 119 W. 40th St., New York City 18. 1959. 422 pages. Price:* $9.

Using the tools of market research and statistical analysis, the author offers an authoritative and workable guide for the selection of retail sites.

He develops the principles of site selection, analyzes in detail the various methods of estimating sales or bank deposits, sets up selection procedures, and discusses current and future trends in retail marketing.

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CORPORATE RECORD RETENTION, VOL 1. *By Robert B. Wheelan. Published by Controllership Foundation Inc., 2 Park Ave., New York City 16. 1959. 242 pages. Price:* $10.

How long should you keep your tax, payroll, and other records?

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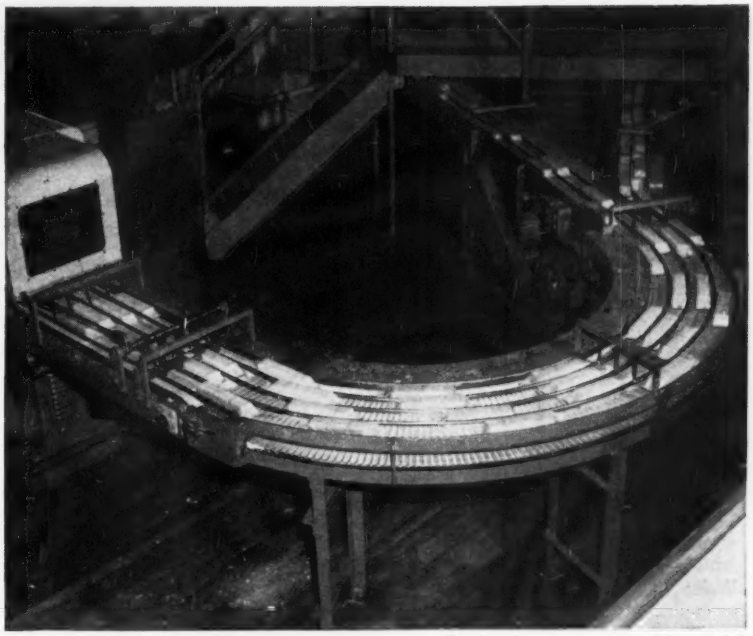
The second volume in the series will cover Canadian federal and provincial records retention requirements. The third will deal with requirements of state governments in the United States.

Industry Moves



Crackers turn corners on an Ashworth Belt

on Metal Process Belts by ASHWORTH

Every industry has its product flow problem; frequently, it's one of "getting around a corner". Around the corner or straightline travel . . . whether it's crackers, popcorn, candy or nuts and bolts . . . there's an Ashworth Metal Process Belt to solve the problem.

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- Occupies less than 1 cu. ft.
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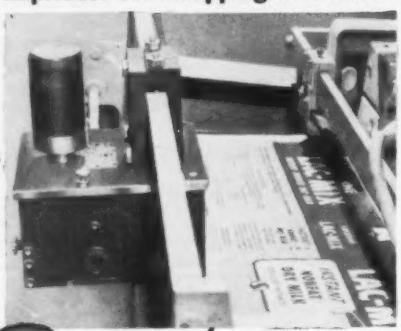

Gottscho "Series 700" ROLAPRINTER® attachment Patented

Compact, lightweight, and easy to install yourself, this precision-made unit imprints codes, prices, contents descriptions, block-outs, promotion specials, etc. on cellophane, polyethylene, glassine, foil, paper, waxed paper, etc. Makes accurately registered, consistently uniform impressions up to 4"x6". Foolproof—requires no adjusting or skill to operate. No change parts needed for different cut-offs. Hundreds already in successful use.

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Quick-Cook Cereal by Toasting Oats; Tempering, Removing Hulls, Cutting Groats, Restoring Moisture, Roll-Flaking.—The Best Foods, Inc., N.Y.C. No. 2,864,701.

Beverage Concentrates Comprising Particles Protectively Coated With Dextran.—Union Carbide Corp., N.Y.C. No. 2,864,707.

PROCESSING

Making Starch With Enhanced Wettability—Foremost Dairies, San Francisco. No. 2,856,290.

Extruding Hot Sugar-Base Flavoring Emulsion Into Rod Shape—USDA. No. 2,856,291.

Preserving Honey With Crystallization-Inhibiting Aliphatic Monocarboxylic Acid—Research Corp, N.Y.C. No. 2,856,292.

Inhibiting Molds by Double-Coating Products With Modicide-Gum Mix and Moisture-Impermeable Material—Best Foods, N.Y.C. No. 2,856,294.

Stabilizing Packaged Malt Beverage by Passing Through Cation-Exchange Resin—Brewing Industries Research Inst., Chicago. No. 2,857,279.

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Solvent-Extracting Vanilla Beans, With Addition of Antioxidant to Extract That's Hydrogenated and Added to Shortening.—R. R. Lochhead, Chesterfield, Mo. No. 2,861,890.

Aseptically Canning Foods Using Pre-Sterilized Cans and Lids and Filling Hot Products in Sterile Space.—Food Mach'y & Chemical Corp., San Jose, Calif. No. 2,862,821.

Dehydrating Heat-Sensitive Fruit Juices by Passing Them Through Low-Temperature Heat-Exchanger and Then Centrifuging.—Union Carbide Corp., N.Y.C. No. 2,862,824.

EQUIPMENT

Sausage Forming and Dispensing Unit—Hans Muller, Biberach (Riss), Germany. No. 2,854,689.

Ice Cream Bar Device Employing Filler Head and Cavity Molds—Tast-Y Sun-D, Inc., Boise, Idaho. No. 2,855,868.

Fish Skinner Comprising Sensing Unit, Rollers and Knife—P. L. Lewis, Coral Gables, Fla. No. 2,856,630.

Continuous Kneader and Twister for Bread Dough—K. K. Kennedy, Cumberland, Md. No. 2,856,868.

Dough Former for Producing Fat-Flour Layer That's Deposited Onto Dough Sheet—J. F. Naylor, Newton-le-Willows, England. No. 2,856,870.

PACKAGING

Setting Up Machine for Paperboard Blanks—Continental Paper Co., Ridgefield Park, N. J. No. 2,852,988.

Window Carton Comprising Dividers—Cornell Paperboard Products Co., Milwaukee. No. 2,854,182.

Easily Openable Carton Top With Deflectible Flaps—Kellogg Co., Battle Creek, Mich. No. 2,854,184.

Self-Closing Bag With Inner Diagonally Folded Upper Corner—International Mineral & Chemical Corp., N.Y.C. No. 2,855,136.

Want more information on any of these recent patents—if so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

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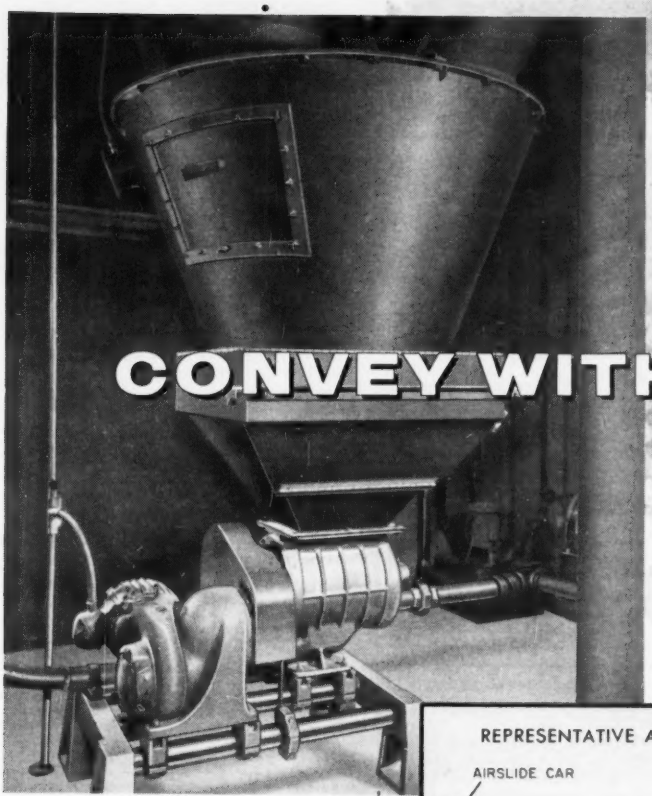

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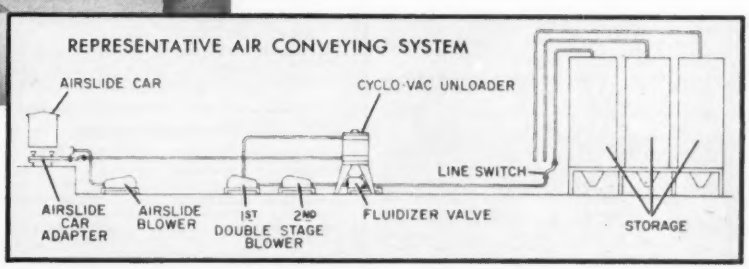

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TO $12,000

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Continued on opposite page

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(Continued from opposite page)

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By John W. Ritter, Test Engineer
SARCO Company, Inc.

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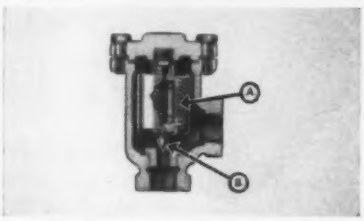

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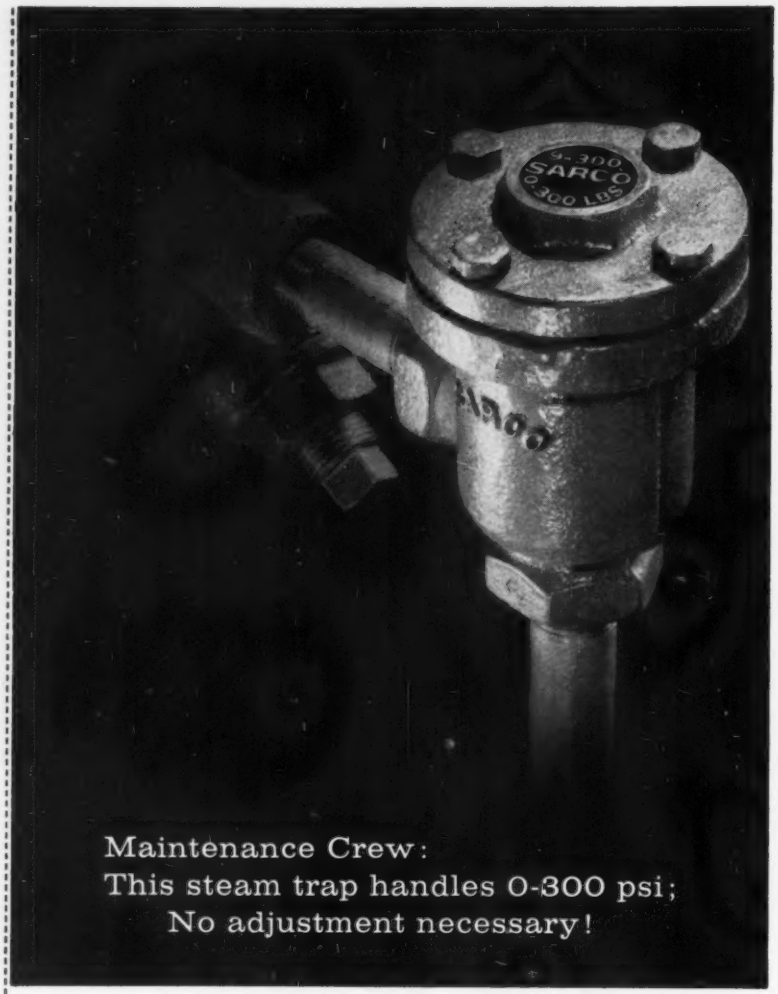

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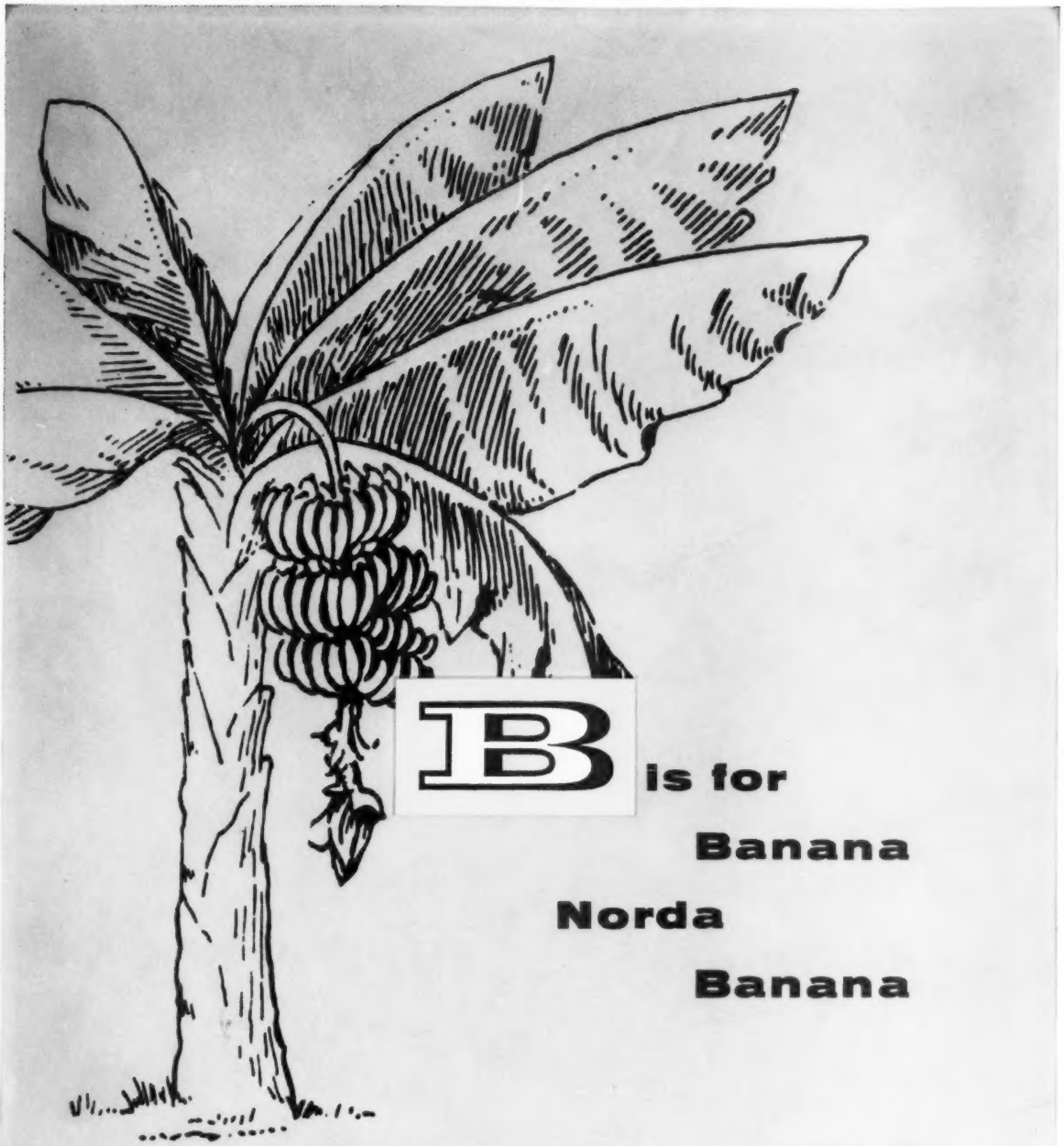

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